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# Electrical Contracting

*With Which Is Incorporated*  
**The Electragist**

**Brewery Wiring**



**Beer Garden Lighting**



**Partial Adequacy**



**Added Outlets**



**Fights Bootlegging**



**Bus Enclosures**





*Hall of Science Building, Century of Progress Exposition. Illumination designed and installed by Federal Electric Co. Jefferson Electric Luminous Tube Transformers used throughout.*



*Jefferson Transformer,  
High Power Factor  
Type.*

## **A new trend in Neon Illumination at the Century of Progress Exposition**

One of Chicago's aims in the Century of Progress Exposition is to demonstrate what can be done with modern architectural design—to repeat the contribution made to architecture by the Columbian Exposition in '93.

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Experience dating back to the very beginning of gaseous tube lighting—high efficiency at all times—mid-point balanced design—extremely low maintenance—models to fit every possible condition, indoor or outdoor—these are a few superiorities which Jefferson Electric pioneering and engineering have brought to the user of luminous tube lighting.

Write for descriptive literature on the Jefferson Electric line including the High Power Factor Type 724.

**JEFFERSON ELECTRIC COMPANY**  
Bellwood (Suburb of Chicago) Illinois

**JEFFERSON**  
*Luminous Tube*  
**TRANSFORMERS**

VOLUME 32  
NUMBER 7

# electrical contracting

WITH WHICH IS INCORPORATED THE ELECTRAGIST  
S. B. WILLIAMS, EDITOR AND GENERAL MANAGER

PUBLISHED MONTHLY

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## CONTENTS FOR MAY, 1933

John Wise .....	5
Beer Garden Lighting by G. R. La Wall .....	6
Partial Installations Under Adequacy Standards by Arthur L. Abbott .....	9
Diversity Keeps Business Up .....	10
Every Employee in Added Outlet Campaign by W. E. Holland .....	11
Denver Fights Bootlegging .....	12
Transite Enclosures for Aluminum Bus Risers by Ralph H. Decker .....	13
Wiring Requirements for Breweries by Wm. A. Haig .....	15
The 1933 Version of a Contractor's Place of Business .....	17
Editorials .....	18
Code Chats .....	20
N. E. C. A. News .....	28
Contracting News .....	32
Manufacturers News .....	40
Index to Advertisers .....	46

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OF ELECTRICAL WHOLESAL-  
ING AND MILL SUPPLIES.

# "WE LOOK FORWARD TO USING STEELTUBES ON OTHER JOBS"



Physics Building, University of Cincinnati—Architects, Crowe & Schultz, Cincinnati, Ohio; Engineer, C. M. Fenbeck, Cincinnati, Ohio; Electrical Contractor, The Fogarty Electric Co., Cincinnati, Ohio. 45,000 feet of Steeltubes installed.

ON March 3, 1933, The Fogarty Electric Company, Cincinnati, wrote us concerning the wiring of the University of Cincinnati Physics Building in which they installed over 45,000 feet of Steeltubes.

Note their comments—"glad to advise you that the installation was very successful—that our men report a considerable time saving in the bending cutting and handling of your product—we look forward to using Steeltubes on future jobs".

Into these few words The Fogarty Electric Company condenses the sales story that has sold more than thirty million feet of Steeltubes since the introduction of this

modern threadless rigid conduit made possible by electrical resistance welding.

Steeltubes has been given broad code and Government approval. It meets every requirement of circuit protection. It has been a vital influence in the letting of many jobs where old-style conduit, providing no more electrical or mechanical protection, proved too expensive. And it has brought profits to hundreds of contractors—just as it will to you.

It costs nothing to investigate. Write today for detailed literature, and a sample box of Steeltubes.

## THE MODERN THREADLESS RIGID CONDUIT Steeltubes

Electrical Division  
STEEL AND TUBES, INCORPORATED  
CLEVELAND, OHIO  
A UNIT OF REPUBLIC STEEL CORPORATION



# Why?

**W**HY should the public buy what the electrical industry has to sell?

This question is not intended to start a fight nor is it for the purpose of getting information. It is, nevertheless, a question that every concern in the industry must answer for itself sooner or later.

For the most part the selling in the electrical industry has been more competitive and less creative selling. If we are to get out of our present depressed condition, we must develop new business. If we are to create business we must find out why the public should buy our products.

**A**T various times the editors of ELECTRICAL CONTRACTING have asked manufacturers of different kinds of electrical products for definite selling information regarding economies or general usefulness.

It is appalling how little manufacturers have seemed to know about the market for their products. Many of them freely admit that they do not know what all the uses are for their product.

Very few manufacturers have up-to-date and authentic data showing economies, or life of their apparatus under differing conditions and usages.

One wonders how some manufacturers get business, so poorly equipped are they with sales information. Well, right now they do not. Under normal conditions there was a demand and these manufacturers merely supplied the demand. Today,

when there is no demand these manufacturers are doing nothing. When it comes to competition they know their own and their competitor's product forward and backward; but when it comes to creating a market, they are not so well equipped.

**O**NE of the first things this industry must do is to find out why the public should buy what we have to sell. Secondly, we must find out who our prospects are. These two points are almost inseparable.

How can we expect our own salesmen, or our wholesalers, or our contractors and dealers to drum up business unless they know whom to approach and what to say to them?

**A**S a starter might it not be a good plan for the manufacturers of one or two devices either to engage some merchandising counsel to make such a study or to appoint one of their own men to do it? We venture to say that the results would be most illuminating.

With such information the industry could begin to create business for those lines. The salesmen and the contractors could work much more directly and intelligently.

Isn't this the first step towards market development?

## To signal for profits in 1933

Enterprising contractors are quick to take advantage of the present market for these time and money saving signals. Graybar signalling devices meet today's needs for lower costs in offices . . . schools . . . industrial plants. In fact, *any* large building. Install these timely signals and profit in three ways . . . on installation . . . on equipment . . . on other electrical jobs that may follow in the same building. Mail the coupon below for full details.

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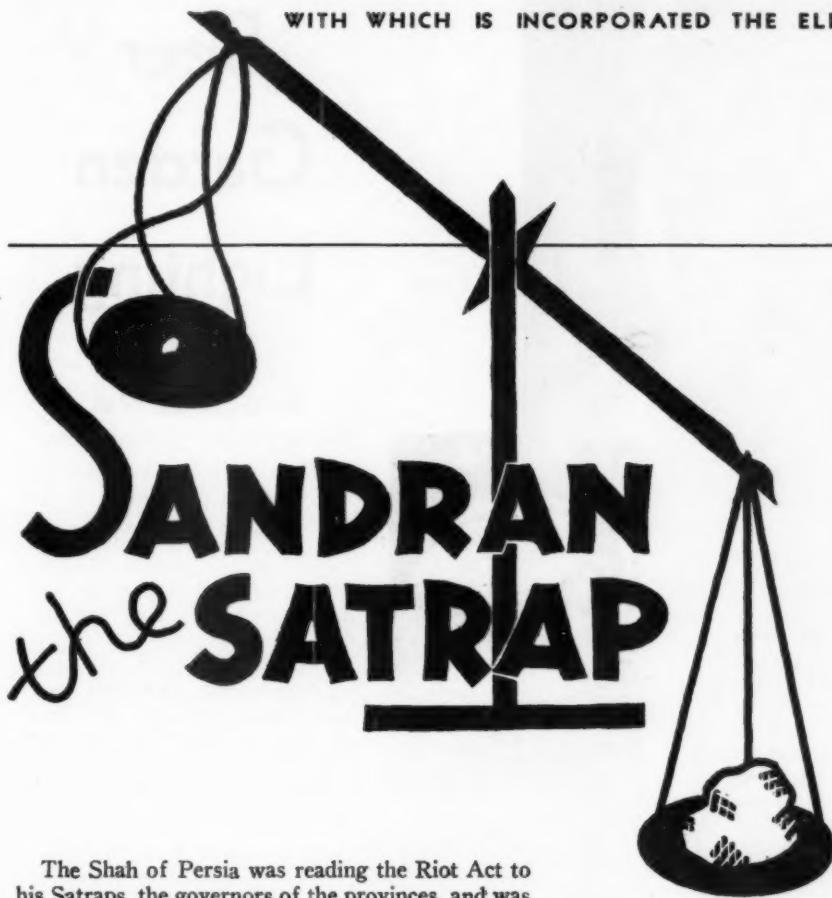
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VOLUME 32  
NUMBER 7

# electrical contracting

WITH WHICH IS INCORPORATED THE ELECTRAGIST

MAY  
1933



## SANDRAN the SATRAP

The Shah of Persia was reading the Riot Act to his Satraps, the governors of the provinces, and was he hot? Boy, he was burning up!

"A year ago," he snarled, "you bozos persuaded me to stop all direct trading and collecting with our people. Your spokesman, Sandran, Satrap of Omra, sold me the idea that the head men in the districts were the proper guys to handle these affairs. Now I find that these nit-wits have let both trade and taxes shrink to nothing plus and the people are actually bootlegging their corn and wheat across the borders. Sandran, this was your brain-child; your number's up, so talk fast and be plenty convincing."

Well, they could smell the lilies on Sandran's sarcophagus, but that baby wasn't the kind to let the third strike go by without swinging. He never batted an eye or said a word—just pulled from under his cloak a small pair of jeweler's scales. On one balance was engraved a nifty crown, representing the Shah, on the other one was the crossed scythes and ploughshare, the trade mark of the head men.

Next, Sandran made their eyes pop by dumping on the table a fortune in gold nuggets, ranging from mere specks to some as big as pigeon's eggs. In the peo-

ple's balance he put a tiny piece like a grain of wheat, but on the Shah's side he placed one of the largest. Right away the poor little squirt belonging to the head men was heaved up out of the scale and lost among the rest on the table.

The Satraps started buzzing. "Treason! Treason!" says one. "The guy's nuts, it's his death-warrant!" says another. "Pipe down, you brush-apes!" says the Shah, "Now, Sandran, Old Wisenheimer, if I get this stunt right, you mean the head men won't poosh-em-up de beezness because they don't like the rakeoff, yes?"

"You said a faceful, Chief," says Sandran, looking him straight in the eye, "They're not quitters, but they can't see burning gas and wearing out tires all over

the countryside for a lousy 5%. If you'll double their commissions all down the line, I'll guarantee they'll play World Series ball, and you'll have more volume than you can handle." "Wrap it up and I'll take it with me," says the Shah, and he took in so much dough the next six months he had a nervous breakdown.

I claim the electrical contractors are in the same fix as the head men; they are willing to go after business and they can serve the factories better than direct selling any day. But they can't and won't operate on margins that leave them in the red.

Naturally, discounts cannot be boosted haphazardly—that would mean backfire later. Rather let all hands get together on this right now and cut the right piece of pie for everyone. The contractors are not only willing but eager to do a real job of selling when, if and as they can make a profit.

How about a little 60-40?



The modern approach through symbolic treatment of the subject. Any degree of realism might be included even to illumination of the foam on the top. The lower portion of the stein might be of flashed opal glass, in which the flashing is on a light amber foundation. Above the ceiling of the "sales room," the stein is a simple built-up cylinder. A single row of large lamps through the axis would produce the desired effect. By this simple construction, a diffusing glass ceiling would be lighted by the lamps above, to illuminate the room below.



## Beer Garden Lighting

By G. R. La Wall  
General Electric Company  
Nela Park Engineering  
Department  
Cleveland, Ohio

For the umbrella a polished metal cone shaped reflector, with four 25- or 40-watt lamps, will give an even distribution of light. The umbrella support houses the wiring.

An inexpensive but effective suggested lighting system, using R.L.M. dome reflectors, mounted 16 ft. high, spaced 16 ft. apart, and equipped with 200-watt lamps.



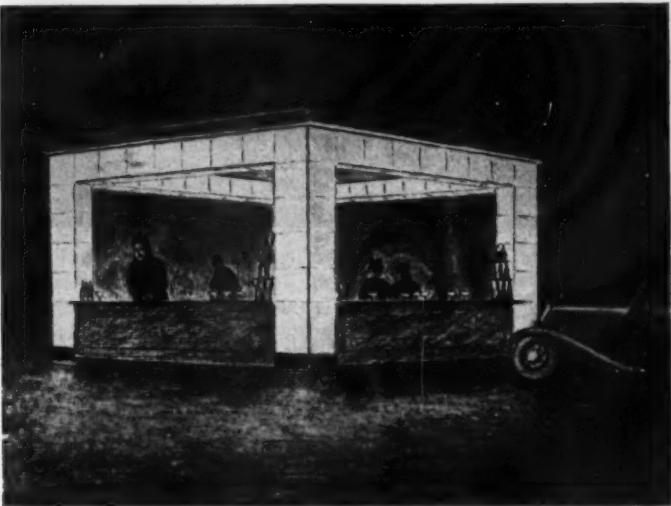
## A New Opportunity for the Contractor

WILL the beer garden in America become the family gathering place as it is in Germany? The answer to this question depends largely upon those groups of individuals whose opportunity it is to create an environment that is attractive, dignified, and exudes an atmosphere of comfort and hospitality.

The electrical contractor is ideally qualified to actively engage in the intelligent promotion of this new field. The problem should be approached with a freedom from tradition—a freedom that is refreshing and inspiring.

Obviously, the beer garden can be lighted in a manner similar to that used in the lighting of most outdoor areas. However, the operators of this new industry will be constantly viewing with each other in the solicitation of new customers, and they will be interested in attractive, decorative lighting treatments that relegate tradition to the background. Whether or not the contractor is successful in securing this new business will depend largely upon his ingenuity and originality. The illustrations presented here are typically American in character and feeling, and show but a few of the many treatments that can be utilized to make the beer garden an attractive institution.

The field is a fertile one—the long heralded opportunity is here—ingenuity is the watchword.



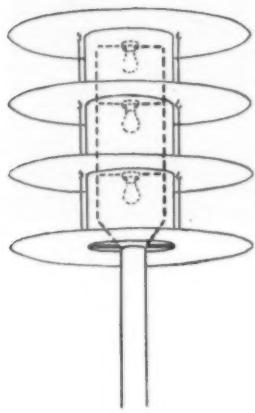
This luminous roadside stand, with its suggestion of neatness and cleanliness, would be sure to appeal to the tired motorist. It might form the center of a group of tourist cabins or a beer garden catering specifically to tourists. Luminous columns and beams, lighted as shown in the sketch, offer an attractive and modern treatment.

This illustration shows how idle miniature golf courses may be converted into very attractive beer gardens. Floodlights are used for illumination. Trees, building or poles may be used as locations for the projectors.

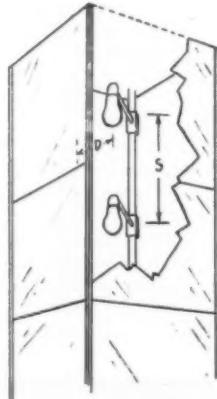




For the legs of this mammoth table, vertical elements constructed like the luminous pylon shown in the accompanying diagram are essential. A single row of lamps along the axis suggests the extreme simplicity of this treatment. The invisible top plane of the table need not be lighted, instead it affords a logical location for the wiring structure. Flashed opal glass is a most convenient and satisfactory translucent medium. For even illumination of all surfaces, without the objectionable spottiness so frequently seen where less practical glass is utilized, the light centers should be spaced one and one-half times the distance of the light center to the glass. Naturally, the greater the depth of the light cavity, the wider the lamp spacing may be. This has definite advantages in the economy of the structure.

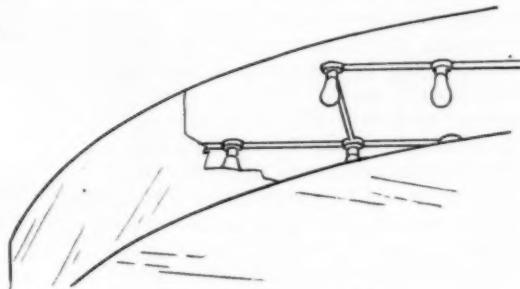


A luminous cylinder is the main source of illumination, with discs preferably of polished metal for outdoor use. A cylinder 12 in. in diameter and 27 in. high could employ three lamps from 25- to 100-watts depending upon the effect desired, the amount of space to be lighted and the number of units employed in a given area.

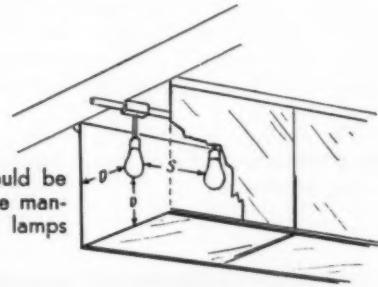


Luminous pylons, pillars or cylinders consist essentially of a suitable metal frame enclosed by flashed opal or other diffusing glass. A line of lamps is run along the axis and spaced 1.4 the distance of the light center to the glass. Thus with a column 12 in. square with lamps 6 in. from the glass space receptacles 8.4 in. along the axis. Use 25 or preferably 40-watt lamps.

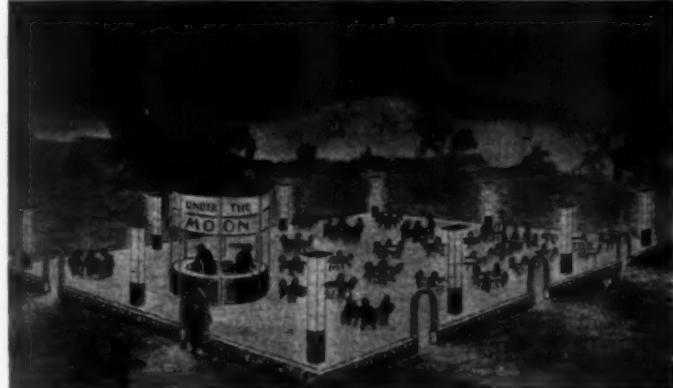
The principle for lighting the table legs is the same as for columns. If the table top is 18 in. thick with an opaque top, lamps may be located 16 in. from the glass and may be spaced up to 24 in. apart. 75-watt lamps will be satisfactory.



Luminous beams should be wired in much the same manner as columns with lamps spaced along the axis.



Illumination of this modern garden with colorful landscaping is accomplished by soft luminous pylons in a carefully planned arrangement. The dispensing stand is similarly lighted. Lighting in this manner removes all possibility of the harsh annoying glare of exposed light sources. Today there is a new appreciation of the comfort in adequate illumination obtained from larger areas of lower brightness, typical of the arrangements shown above.



# Partial Installations Under Adequacy Standards

By Arthur L. Abbott

THE first result of the Adequate Wiring Standards should be to bring about a better conception in the electrical industry of what constitutes an adequate wiring installation in the home. Public acceptance may be counted on as certain to follow industry acceptance, but will be accomplished gradually.

While the aim should always be to convince the owner or builder of his need for a complete installation, fully in accordance with the Standards, it is certain that many cases will be met, particularly at first, where the complete job cannot be sold. In all such cases the buyer should if possible be made to understand the ultimate economy of providing at least the foundation of an adequate wiring installation, upon which he can build, as further need arises, without discarding any of the original equipment.

## Make Service Adequate

In the first place, every house should be equipped with a service of adequate capacity. For the average small house this will probably mean a 60-amp. service, which was shown in the article in the April issue to cost complete about \$27.00, the selling price being about \$36.00. The service that would otherwise be installed would probably be not smaller than three No. 8 wires with a 30-amp. switch. Such a service would cost about \$10.00 less than one of 60-amp. capacity making the selling price about \$23.00. Thus for an additional expenditure of \$13.00 the owner will be provided with ample capacity in this part of the installation for any load he is ever likely to connect, so far as can be foreseen at the present time. It is quite probable that the No. 8 service would at some time have to be torn out and replaced and would then represent a dead loss.

Having provided a service of suffi-

cient capacity, the job must be left in such condition that the capacity can be made use of without replacement or rearrangement of any of the equipment. This costs nothing. All that is necessary is to leave space for an additional cabinet to contain fuses for the range, water heater and other appliances and to leave the original work in such shape that the feeder to the additional cabinet can be installed with the minimum amount of labor.

## Branch Circuits

Next in order of importance comes the branch circuit layout. It has previously been stated that the additional cost of the standard layout is so small that this method may well be universally employed. Where cost is a large factor, a saving can be made in the special appliance circuits by running one of these circuits to all convenience outlets in the kitchen and dining room and one to the laundry, instead of running both circuits to all three rooms. This arrangement will give good results and will certainly provide a great deal more capacity at these outlets than is provided in the majority of existing wired homes.

In a house having about 1,500 sq. ft. of floor area, it is probable that at the very least, something over 24 outlets will be installed. Under the 12-outlets-per-circuit rule, the minimum would be three branch circuits. The suggested layout would call for one additional No. 12 circuit to receptacles in the kitchen and dining room and one similar circuit to the laundry. It will be readily seen that the additional cost will be small.

## Special Circuits

Quite a number of municipal codes require some special circuits for the heavy load area. A separate circuit may be required for an iron outlet, a washer or a refrigerator, or the num-

ber of receptacle outlets may be limited to three or four per circuit. Modification of these codes to permit the use of the suggested layout would in some cases result in an actual saving to the home owner and would still provide ample capacity.

Circuits for a range and water heater can be installed at any time at about the same cost as if included in the original contract, so these items can be omitted if not required for immediate use. Where one or both of these circuits must run across a ceiling that is to be plastered, the attention of the builder should be called to the fact that exposed wiring will be required unless some provision is made for concealed work while the house is under construction.

Circuits for built-in heaters in second and third floor bath rooms will be difficult to install after the house is completed and should at least be dropped to the basement if the owner can stand this small expense. Termination of these circuits in the bath rooms is a somewhat difficult detail. One suggestion is to bring the wires into an outlet box at the proper location for the heater, provide the box with a cover and build it in the wall behind the tile. The ends of the wires should be taped and a record should be kept of the location of the box.

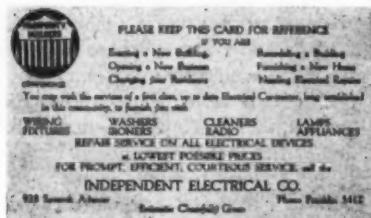
## Outlets

If the owner or builder feels unable to pay for more than a medium number of outlets and switches, some expert advice will be extremely valuable to him. First, certain outlets and switches are practically necessities and none of these should be omitted. Then there may be some outlets which an experienced man will see are desirable and which would be quite difficult and expensive to install after completion of the building; these of course ought to be included in the original installation. Finally, all work should be laid out so as to make future exten-

sions to additional outlets as easy as possible. All circuits passing through the basement should be made accessible by means of junction boxes. If the attic or roof space is accessible, all circuits to second floor outlets should be carried up to the attic so that new outlets can be reached by dropping down from above.

To make these provisions for the future expansions of the wiring system will probably cost, in the average house, from \$50 to \$75 more than would be spent for the ordinary wiring layout. The money so expended will represent a permanent investment because no part of the wiring will have to be replaced on account of inadequate capacity.

#### POST CARD BRINGS BUSINESS



Little business building ideas sometimes bring big results. Fred Edwards, proprietor of the Independent Electrical Co. of San Diego, Calif., found it so with a simple post card which he employed in conjunction with a local business drive on the part of all merchants in his city. The local campaign was called a "Prosperity Builder" campaign, and buttons were given all those in the community who made purchases that they had delayed making. The design of this button was that of a shield with the name of the campaign upon it.

Using this shield on the post card Mr. Edwards listed a number of possibilities, such as "erecting a new building, opening a new business, changing your residence, remodeling a building, furnishing a new home, needing electrical repairs." By scanning the newspapers and building permit reports, he obtained the names and addresses of numbers of people doing or contemplating doing one or more of these things. A red pencil check mark opposite the item called attention to it as a personal need of the recipient, anticipated by the electrical contractor. Likewise a list of the services or appliances carried by

the contractor-dealer was checked with red pencil to suggest an item possibly needed.

"It was surprising to me that I got as much response to the cards as I did," said Fred Edwards. "And I

continued to receive long after the mailing. I believe a great many people are keeping the cards as a reminder to look us up when they do get ready to get repair work done or buy appliances."

## Diversity Keeps Business Up

AN excellent example of diversification is presented by the operations of The Electric Wiring Company at Medford, Ore., operated by H. O. Purucker. As a dealer, he specializes in radio, refrigeration and oil burners, having what is said to be the best equipped radio service shop and laboratory south of Eugene. He is also the only contractor in Medford equipped to do motor re-winding and re-building. His place is the official service station for Master and Sterling motors. In his motor service work he covers a radius of operation of approximately 150 miles.

Oil burners, both sales and installation, are another line from which considerable revenue is derived, and in addition to that the company hangs and services neon signs.

In connection with radio, it may be said that Mr. Purucker is himself a radio technician and takes pride in the fact that they have never been stumped on any kind of a set brought in for repair. He aims to keep essential parts for every kind of radio set that is used in that locality, being



H. O. Purucker

in effect practically a jobber of radio parts and accessories for other dealers in and about Medford.

The service shop, though small, is more than usually complete as to equipment and even that is "departmentalized", radio, refrigeration, oil burners and motors being tested and repaired each in its own section of the shop.



A compact departmentalized shop

*Electrical Contracting, May, 1933*

# Every Employee in Added Outlet Campaign

By W. E. Holland  
President, Dallas Electric Club

FOR more than a year the Dallas Electric Club, a social organization in which every branch of the electrical industry is represented, has been trying to determine what it could do to help the industry as a whole. In cooperation with the Electric Club, the Dallas Power and Light Company recently made an appliance survey of their entire personnel. This survey disclosed that there is a potential market for electrical installations in Dallas amounting to nearly two and a half million dollars in material and labor, and that the outstanding need is for convenience outlets.

The detailed figures of the market follow:

Convenience outlets .....	\$1,000,000
Garage and yard lighting....	330,000
Replacing drop cords with simple fixtures .....	275,000
Front porch lights.....	55,000
New fixtures and wiring to replace unshaded lamps.....	418,000
Additional switches .....	418,000
	\$2,496,000

This questionnaire also reveals that of the 8,000 appliances owned by employees, 2,800, or 35 per cent, are not being used—simply because there are no convenience outlets at the proper location.

It was logically concluded that if the employees of an electric company need convenience outlets in their homes, the public in general would be in even greater need of such service. Consequently the Electric Club conferred with electrical contractors in Dallas and decided to launch this Convenience Outlet Campaign. The fact that the City has recently adopted a new electric ordinance embodying the National Electrical Code as the wiring standard and making possible the installation of wiring devices and equipment at reduced prices, also entered into the decision to promote such an activity at this time.

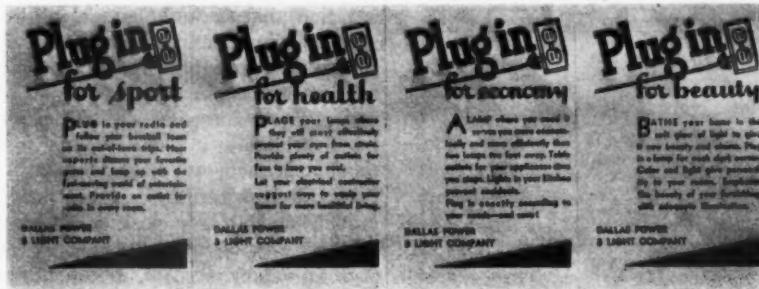
Elaborate advertising and publicity was put behind this entire effort. Large ads announcing the opening of the activity appeared in the four daily newspapers in Dallas on April 9, 10 and 11; two fifteen minute radio programs pointing out the advantages and economies of convenience outlets were broadcast each week over the

local stations; four full size illuminated outdoor posters are located on major highways leading into Dallas; and a full page ad has appeared in "Dallas Hospitality," a publication issued by the local electric company and reaching fifty-five thousand residential consumers. "Dallas," an industrial magazine edited by the local Chamber of Commerce, also carried a full page ad in April, and throughout the duration of this activity smaller ads giving news of the campaign appeared in neighborhood and daily newspapers.

All employees of the electrical industry worked together to make this endeavor a success. They explained to all interested persons that under the existing ordinance it is now possible to have three duplex convenience outlets installed in one home, under average conditions, for as little as \$7.50; that by calling their electrical contractor they could have his representative make a careful estimate of their requirements, without obligation.

Every employee of the industry was furnished with a blue button. This was advertised as an identification emblem.

Full Page Advertisement, Featuring the New Ordinance and Reduced Prices



Three-Inch Advertisements of the Power Company

# Denver Fights Bootlegging

A VIGOROUS campaign is being waged by the Denver city electrician against electrical work being done by unlicensed people as well as work being done by licensed contractors without a permit. Denver adopted a new code and ordinance which became operative March 1. This was made the occasion for telling the public through the newspapers that the city intended to enforce all provisions of the new regulations.

Since March 1, the city electrical department has had five contractors fined for violating the ordinance and fourteen unlicensed men fined for doing work without a license.

While the city is conducting its campaign the Electrical League of Colorado is running a series of four advertisements, telling the public that unlicensed people who do electrical work are liable to be called into the police court and fined. These advertisements appear generally a day after the appearance of a story of conviction for "bootlegging."

The check-up of bootleg wiring is done not only by watching new work but by reinspection. "Contrary to the general opinion of various electrical inspection departments throughout the country that new work only

should have rigid inspection," writes John Malpiede, city electrician, "this department believes that surveys of old work, bootleg wiring and other conditions hazardous to life and property resulting from poor wiring, are more important and demand a more thorough inspection than new work, which, if done by a licensed contractor under the proper permit, automatically is correct before the final passage of the job.

"The following are a few suggestions as to how our department has attempted to carry on its present campaign:

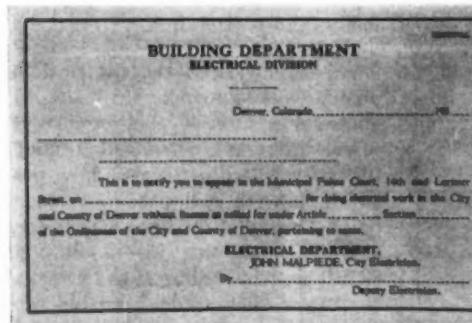
"1. The chief electrical inspector trains his men to know that the majority of the public do not understand the hazards which result from various types of work being done by unlicensed men or amateurs, and that the inspector must take time to explain to the public the dangers resulting from such installations.

"2. This department has three forms of notification which it issues:

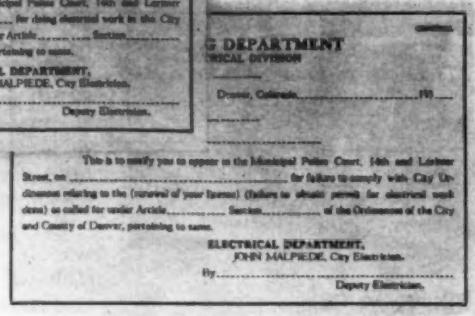
(a) A survey is made of the entire building or residence in question, and a first notice is left with owner or occupant, giving him or them, five days within which to make the necessary corrections.

(b) After this five-day period has expired, and the correction has not been made, a second notice is given, giving five additional days.

(c) If this second notice is ignored by the owner or occupant, the



The summons above is for people without a license. That at right is for bootlegging by contractors.



## Warning

**To Home Owners, Tenants and Building Managers**

The Building Department of the City and County of Denver has issued a new Electric Wiring Code. This Code becomes effective in the form of ordinance, governing the installation of electric wiring and equipment, and has the endorsement of the Building Department.

Numerous cases have been brought to the attention of the Building Department wherein these ordinances are being ignored, primarily by contractors and "handymen" who are installing outlets, running fixtures and making electrical repairs in direct violation of the Code. In some instances owners have been found guilty of this unlawful practice.

In the interest of safety to life and property the public is reminded that none but reputable, bonded and licensed electrical contractors should be employed to do electrical work of this nature. Whenever you have need to employ an electrician demand to see his credentials and insist that he produce a Certificate of Approval on completion of the installation as your assurance that it has been made in accordance with approved methods.

The Building Department of the City and County of Denver is authority for the statement that anyone found violating the provisions of the ordinances will be CALLED INTO POLICE COURT AND FINED

**Electrical League of Colorado**

Gas & Electric Bldg., Denver

One of the League's Advertisements Tying in with the Campaign.

public service company is notified to disconnect service to the building.

"In cases where this department observes work being done by an unlicensed man, we immediately serve a notice on him to appear in police court. In cases where licensed men are discovered doing work without the necessary permit or permits, they too are cited into police court.

"This department feels confident that with the rigid enforcement of our ordinance, and the splendid co-operation given it by the city administration, that these violations will be greatly eliminated. This will, of course, increase the number of permits and the department's revenue.

"In the enforcement of the electrical ordinance, it is the intention of this department to always be positive that the violation has been committed, and of its position before bringing anyone into court, but when such an action is taken, it is definite and no fixing or withdrawals of complaints are allowed."

# Transite Enclosures for Aluminum Bus Risers

By  
Ralph H. Decker  
A. S. Schulman Electric Company  
Chicago, Ill.

In the February issue of this publication, the installation of the six, aluminum channel secondary bus risers in the new Field Building, Chicago, Ill., was described. This article will describe the transite enclosures for these bus structures; the structural steel supports for the transite; the installation of terminal boxes for feeder taps; and the mounting of lighting cabinets and meter tubs on the enclosures.

On account of space limitations it was necessary that the bus enclosure be designed to properly enclose the bus structure and support the cabinets, meter tubs and terminal boxes without encroaching upon valuable rentable area, at the same time permitting ease of installation and free access to the equipment, to insuring operation at maximum utility.

The architectural layout required slight off-sets in the cut-out closet areas which would normally necessitate offsets in the riser. By designing the bus structure to rise at a point common to all the closets, and at the same time permitting the mounting of cabinets, tubs and boxes in an accessible position, lateral offsets were avoided. Offsets of two or three inches to the rear of the closets were required at two locations in the risers, on account of structural steel conditions. Lighting cabinets were mounted on the front face of the enclosures, with the meter tub at the right or left to conform to the space available.

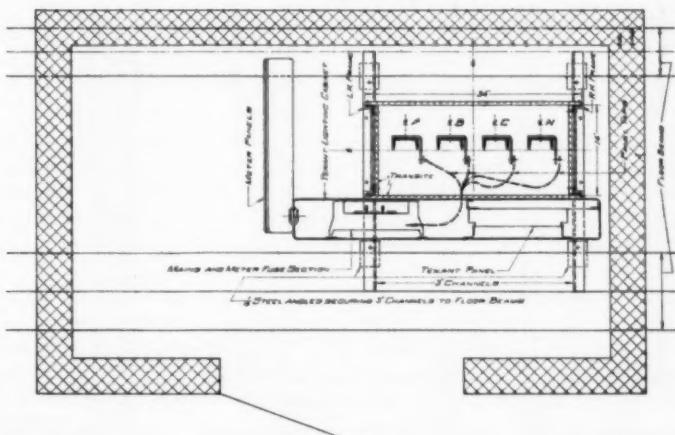
The first operation in the erection of the bus enclosures was the installation of steel angle frames and their supporting 3 in., 5 lb. channels at each floor level.

Two 3 in. channels, one on each side of the riser for supporting the

frames, were of sufficient length to span the floor beams and girders paralleling the riser and were firmly secured in place by means of a formed 3 in. by 4 in. by  $\frac{1}{4}$  in. clamping angle and 5/16 in. bolt. The long leg of this angle engaged the under side of the floor beam or girder, the short leg resting against the lower flange of the 3 in. channel. The tightening of the bolt maintained the channels in their required position. This feature is indicated in the accompanying draw-

upper horizontal angle being bolted to the bottom flange of the corresponding 3 in. channels spanning the floor beams at the floor level directly above. Angles were bolted together with 5/16 in. R. H. machine screws of sufficient length to engage the  $\frac{1}{2}$  in. transite sides.

The drilling of the framework was adapted to the installation of the transite sides, lighting cabinets and terminal boxes, all holes being drilled  $\frac{3}{8}$  in. for 5/16 in. R. H. machine screws and hexagon nuts



Plan of C.O.C. space showing position of channel buses, the enclosure, lighting cabinet and meter tub and panels.

ings. These channels were plumbed and clamped in place before the frames were erected.

The frames were built right and left hand with  $1\frac{1}{2}$  in. by  $1\frac{1}{2}$  in. by  $\frac{1}{4}$  in. vertical angles, and 2 in. by  $1\frac{1}{2}$  in. by  $\frac{1}{4}$  in. horizontal angles, the lower horizontal angle being bolted to the top flange of 3 in. channels spanning the floor beams, the

which were used throughout. Economy in assembly was attained by the use of these slotted screws and hexagon nuts; "Shakeproof" lock washers being used under each nut.

Frames and channels were delivered to the building drilled, and the frames assembled ready for erection; each frame and channel bearing its item number corresponding

to the erection drawings. The system of numbering identified each part and facilitated erection without error.

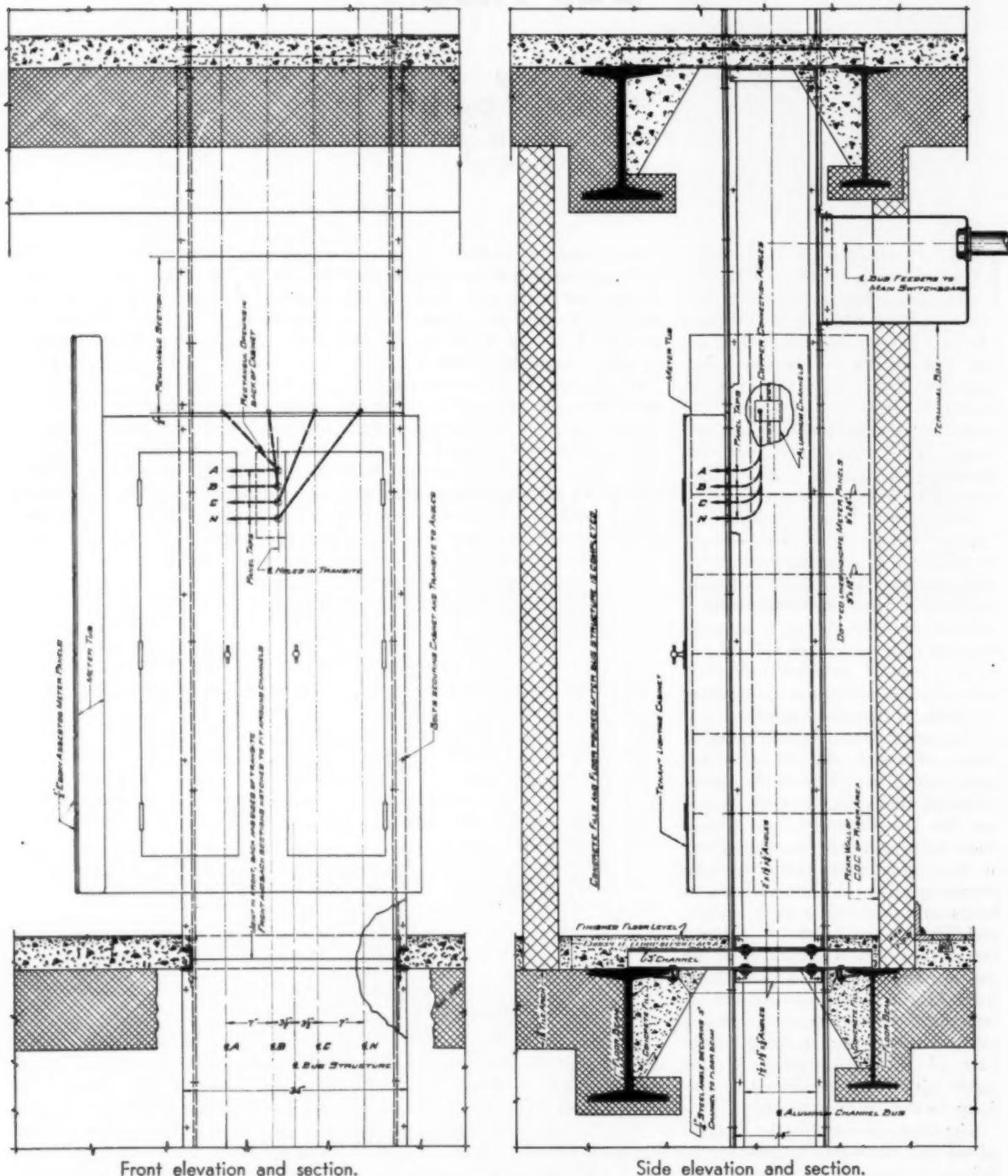
The  $\frac{1}{2}$  in. transite on the sides, front, and back of the steel frames

is continuous the entire height of the risers, except at the location of terminal boxes.

Standard 96 in. lengths are used directly above the floor levels on the sides and back, with shorter lengths

extending from the top of these pieces to the floor level above.

The lower front section extended from the floor level to a point  $\frac{1}{2}$  in. above the top of the respective lighting cabinets, with a 20 in. re-



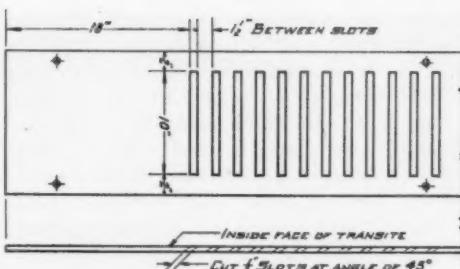
Elevations and sections of the channel bus enclosure showing structural conditions and the method of installing the steel supporting structure, transite enclosure, lighting cabinets, meter tubs and panels, and terminal boxes for bus feeders.

movable section above the cabinet permitting access to the bus taps, and a short section above this to the floor level above.

The 96 in. side and back pieces were cut  $\frac{1}{8}$  in. short of the figured dimensions to provide a clearance compensating for irregularities in the framework and butted transite joints. The front and rear transite panels were notched to fit around the 3 in. channels supporting the steel angle frames.

The transite pieces were delivered to the job, cut, drilled, notched and marked with their respective part number, ready for bolting to the framework.

After the floor fills were completed the 3 in. channels, the top and bottom of the frames and the top and bottom of the transite sides be-



Detail showing method of slotting transite for providing ventilation in the bus enclosure.

came an integral part of the building.

Artificial ventilation of the bus enclosures is provided for by means of a duct connection from their upper end to an extraction fan; and slots in the transite sides at the three lower floor levels of the riser. These slots were cut across the width of the transite to within  $1\frac{1}{2}$  in. of the edges and at an angle of 45 deg. This slotting eliminated the use of sections of steel louvres which are

objectionable from an electrical and installation standpoint.

The cable taps from the bus connections to the main terminals on the lighting panels were threaded through a vertical row of four holes on  $2\frac{1}{2}$  in. centers in the transite back of the cabinets. A rectangular opening was cut from the back of the cabinets to prevent grounding of the conductors at the point where they were brought through the holes.

## Wiring Requirements for Breweries

By  
Wm. A. Haig  
Chief Electrical Inspector  
Milwaukee, Wis.

FEW industries have need for so many comparatively small amounts of power applied in widely separated departments, as breweries. In meeting these conditions, electricity is being implied more and more as an ideal means of transmission.

Of all the advantages of motor drive, for breweries, the three most important ones from the fire protection point of view, are cleanliness, simplicity, and reliability.

Cleanliness, if not valiantly striven for by the brewery manager, is nevertheless compulsory in this age of stringent pure food laws, and while the kind of machinery used has less to do with the cleanliness of the product than in any other industry, still the absence of grease, oil, dust, etc., which is characteristic of motor drive, is of some importance.

The use of electric lights in breweries is well established. Electricity is also replacing several old established manufacturing hazards by the use of electricity for heating glue pots,

resin heaters, branding irons and beer vat driers. It becomes of extreme importance therefore, in view of the increasing use of electricity in breweries and the decrease of other hazards by virtue of this use, to see that this introduction of electricity is done in such a manner as not to substitute a serious electrical hazard in lieu of others eliminated, which may more than counteract the good results contemplated.

### Brewery Operations

For those unfamiliar with the operations of a brewery, the following summary is given:

The manufacture of beer involves two separate and distinct operations. First malting and then brewing. The object of malting is to so change the chemical composition of the contents of the barley grains as to render them soluble in water, so as to produce a liquid which can afterwards be subjected to fermentation. The process consists of steeping the barley in

water in order to soften the husks; the barley swells in consequence and is then placed on the floor of the malt house. It begins to heat and to germinate, and from the proteids in the malt there is developed a curious substance called diastase, which has the property later of attacking the starch and converting it into maltose and dextrin, which are soluble products. When the process of germination has reached a certain point the barley grains are spread over a large floor and turned over from time to time to prevent over-heating, and germination proceeds. When it has reached the proper point, as determined by inspection, the malt is subjected to kiln-drying, the purpose of which is to terminate germination, because if it is allowed to go over, the result would be a garden of barley plants of no further value for beer making.

Next comes the brewing by which the malt is converted into beer. The crushed malt is extracted in hot water,

when the diastase completes its action in changing the starch to dextrin and maltose. One part of diastase is sufficient for 200,000 parts of starch. After the malt has been sufficiently treated the solution is drawn off and this constitutes the wort. The remaining grains are subjected to a careful treatment of water to obtain as large a portion of soluble matter as possible, the worts are united, hops are added and the wort is complete. It is then rapidly cooled to the proper temperature, the yeast is added and fermentation proceeds. During the fermentation the yeast develops, attacks the sugar and liberates carbonic acid gas and alcohol. The rise of the carbonic acid gas through the liquid causes motion and the liquid is set to work. When the fermentation is complete the beer is drawn off and stored in suitable vats that it may properly age and undergo slow after-fermentation and ripening, and the liquid becomes clarified. The sediment of the yeast is found in the bottom of the vessels in the case of lager beer, while in the case of ale the yeast is found in the form of scum on the top. This indicates that the fermentation has been either bottom fermentation or top fermentation. Finally the beer is filtered and placed in barrels or bottles, the latter being generally pasteurized. American beer usually contains from 5 to 6 per cent of extract or soluble food products. It contains from 3 to 6 per cent of alcohol.

#### Wiring Problems

In wiring breweries for electric light and power, many difficult problems present themselves.

Moisture, ammonia, dust, and gases which prevail in breweries makes it necessary to have the best and most lasting electrical system obtainable. Notwithstanding the fact that open wiring on knobs and cleats is usually considered the ideal installation in places of this kind, Milwaukee's experience shows that a rigid conduit job is the best type if properly installed with the conduit outlets and fittings sealed with asphaltum compound, and the pipe threads thoroughly treated with white lead. The white lead deters corrosion and rust on the pipe threads and the asphaltum compound prevents attack on the copper by the ammonia. The location of fuses and switches should be installed in such a manner and in such enclosures as

to exclude moisture and ammonia fumes, and the enclosures should be of such material to withstand corrosive vapors. Porcelain, hard rubber, or composition weatherproof keyless sockets may be used. Where porcelain sockets are employed they should be kept out of reach as they are easily broken. Wiring in a brewery should be regularly and carefully inspected, especially in the cold storage sections.

#### Special Hazards

In elevating the grains, malt and hops as well as cleaning and grinding the same, dust of a highly explosive nature is present, therefore all the rules 3204 National Electrical Code should be carefully complied with. Extension cords used for lowering into bins for inspection while filling, should be of the vaporproof type and well guarded.

One special thing to watch particularly in the grinding operations, is to provide magnets to remove all particles of iron or steel to prevent any metallic sparks which might explode the dust. Some magnets are so arranged as to throw such particles of metal aside, while others hold the metal until it is removed by hand. Magnets should be carefully watched and replaced when they begin to show any weakness.

Another recommendation is for phosphorous bronze instead of iron flanges on worm conveyors thereby removing the danger of metallic sparks in this dusty location.

In the brew house proper, we have steam and moisture to deal with, and all joints, outlets, etc., should be well protected.

One incidental hazard of the brew house is the presence of sulphuric acid for cleaning the copper kettle.

Another matter is the cooler or "beer fall" which is a pipe cooler in two sections, the upper one cooled by water, the lower one by brine or ammonia. The wort runs down over the outside surfaces of the pipes, creating a damp location.

In the fermenting cellars we have alcohol and ammonia fumes as well as carbon dioxide which escapes over the sides of the butts and falling to the floor is usually carried away by an artificial draft.

#### Varnishing

Wooden vessels in the breweries, like starting vats, fermenting vats, stocks tubs, and chip casks, are var-

nished for the purpose of preventing any extractive matters that may remain in the wood from getting into the beer. Explosive and inflammable fumes are present during this process and care should be taken to provide protection from arcing or sparking parts of electrical equipment.

#### Racking Off

This is the name given to the process of filling kegs and bottles with beer. Needless to say, this location is damp and requires weatherproof fittings, as do also the bottling and washing departments.

#### Pitching

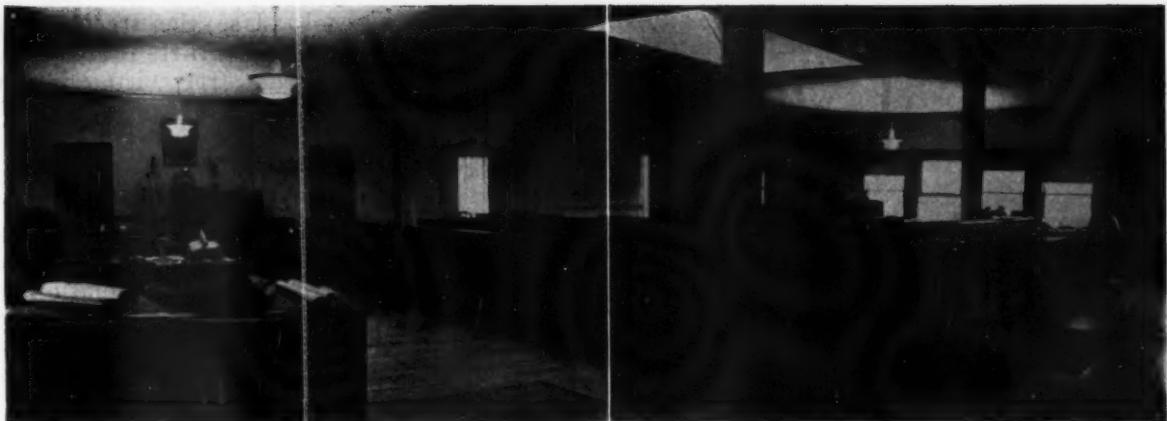
This is admittedly the most hazardous operation in a brewery. It consists of covering the interior of kegs or barrels with a coat of pitch to prevent the beer from coming in contact with the wood. Ordinary brewer's pitch, most commonly used, is a purified resin of certain coniferous trees, such as pines and firs. This pitch liberates explosive and inflammable gases and vapors, and all electrical equipment in the vicinity should be absolutely vaporproof in every respect. In order to be sure that the pitching job is complete on every keg they are examined by dropping an electric light inside through the bung hole to see if there is any broken pitch. Some lamps used for this purpose are only  $1\frac{1}{4}$  in. in diameter and 2 in. long and are mounted on an insulated holder and provided with a wire guard.

#### Refrigerating Plant

As is commonly known in refrigerating plants, moisture and ammonia fumes are present, therefore care should be taken to guard all electrical equipment from these hazards. If lights are necessary near the compressor or oil trap, vaporproof globes should be used.

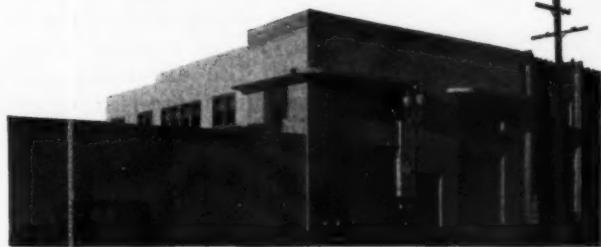
#### Extension Cords

Because frequent "washing down" operations in breweries involve heavy hose streams, all extension cord plug stations should be waterproof type and all drop cords, etc., should be of the type known as brewery cord. Extension cords should be specifically designed for damp locations and hard wear. This latter is extremely important when it is realized that about two-thirds of brewery electrical maintenance work consists of renewals and repairs of drop and extension cords.



## *The 1933 Version of* **A Contractor's Place of Business**

The engineer-salesmen's desks are along one side of the room, and the office and bookkeeping department on the other. Offices of Roy Spilsbury, vice-president and general superintendent, and of Glenn Arbogast, president and general manager (rear of photograph) facing the street. Back of the general office is a small estimating and drafting room and a rear porch which gives access to the yard below and the shop.



New offices of Newbery Electric Corp. of Los Angeles.



A corner of the estimating and drafting room. Vertical stalls hold blue prints being worked upon by means of a simple twisted piece of brass rod, hinged at one end.



Glenn Arbogast in his office. The entire place is electrically heated and lighted by indirect fixtures.

To the left of the entrance, at the foot of the stairs leading to the general offices, is a small room displaying equipment in which the company specializes, such as street lighting, and other lighting reflectors. It is used to confer with customers.



# electrical contracting

*With which is incorporated The Electragist*

S. B. WILLIAMS, Editor

## FREE WIRING

**E**SAU sold his heritage for a mess of pottage because he was hungry. We hope the electrical industry is not going to do likewise.

On every hand we hear of appliance rental projects and free wiring. It has even been suggested that we go into free wiring on a national scale and give 500,000 homes each year a \$50.00 free wiring job to stimulate appliance sales.

We know that business is very, very slow and that almost any morsel of business under almost any condition looks like manna from Heaven. These free wiring jobs may provide a little food today, but they will cost the contractors a whole lot of business tomorrow.

In one city with a range rental scheme the wiring was given away with the first 500 ranges. The contractors got approximately \$40 per range for wiring—\$20,000.

How long will this company pay \$40 a range? How long before this company does like a municipal plant in Michigan which furnishes the material and gives the contractor \$15 to install a range?

When the price falls below what the worthwhile contractor can do the job for will the power company hesitate to patronize the less competent contractor or even to set up their own contractors?

Free range wiring is only a step towards other free wiring. When this is proposed, urge that the money that would be spent in free wiring be used for sales promotion.

Don't cheapen your product by admitting it can't be sold but must be given away. Sell the public on the value of your services and

a good wiring job. Use the free wiring money to create bigger markets that will be sold to the extent that free wiring is not necessary.

## PRICES

IT is going to be advisable for contractors to use considerable caution during the period of upward prices which inflation is bound to bring. Before taking a contract one should confirm prices and try to get protection.

Many products, particularly those involving considerable labor in their manufacture, will not fluctuate in price rapidly but products in which the raw material is a factor, such as wire and conduit, can advance seriously in the time between the filing of a bid and the placing of a contract.

It will also be advisable when doing time-and-material work to check the market price at the time the work is billed out because the price to the customer should be the current price and not the price paid for the material by the contractor. When the market price was falling the contractor had no choice but to change current prices and he was stuck with the difference. When prices are advancing there is no reason why he should be stuck again. He must replace used stock at higher prices.

## PROFITABLE SALES

**S**OME interesting studies have revealed that more than 80 per cent of the industrial business comes from approximately 10 per cent of the customers. These customers can be sold direct by the manufacturers at a profit.

What are we to do about the rest of this market which, while only a small part of the total market, takes in 90 per cent of the prospects? This is the market in which the industrial contractor, the wholesaler, the large and the small manufacturer seem to be in lively and unprofitable competition.

There are two things which ought to be considered before coming to any conclusion. The first is how much margin a manufacturer can allow on any piece of apparatus and still make a reasonable profit. Perhaps this is a new idea in the distribution of industrial electrical equipment; but might it not be well to determine, not what is the smallest margin which dealers will accept,

but what is the largest margin the equipment will bear.

Having determined the margin, the next step is to find an agency which can sell this market at this margin and make a satisfactory profit.

The industrial electrical contractor offers one admirable possibility because he not only has the "in" in so many of these plants but, because he is selling so many different kinds of materials as well as labor, he can apportion his selling costs to more than one equipment. Also when he sells one kind of equipment, such as a motor, there are certain other things that must go with that order if the equipment is to be operable.

Manufacturers complain that wholesalers and contractors are not developing industrial business as they should but it is not because they do not want to. It is because they cannot go any further than they are now going without losing money.

The manufacturers know that as the customers get smaller the cost to sell becomes greater. The manufacturer knows that every time a salesman makes a 30-minute call the cost is the same no matter what the size of the customer may be. These same conditions hold true with the industrial contractor.

If they are to widen and intensify their selling activities they must be able to make a profit in these sales.

#### LOCAL LEGISLATION

A NUMBER of instances has occurred recently where small contractors have attacked local ordinances on the grounds that they were discriminatory in favor of larger contractors.

Such attacks are unfortunate for two reasons. First, they might have been avoided in many instances if the promoters of the ordinance had made freer use of the national advisory services of the National Electrical Contractors Association and the Uniform Ordinance Department of N. E. M. A.

Secondly, any such attack reflects badly upon the so-called favored contractors. The public is always ready to believe that a trade organization is a racket.

While there might be some cases in which a few contractors have tried to sew up the local ordinances in such a way as to make it exceedingly difficult for anybody else to engage in the business, the contractors generally who promote local ordinances are hon-

estly attempting to provide good fair measures in the public interest.

We would urge contractors' organizations that are planning to introduce new legislation to first secure from the associations above referred to, all the advice and suggestion they can give as to form and content. Then when the draft of the proposed legislation is ready, to sell the public on the need for such ordinances through newspaper publicity. This can best be done through the medium of the city inspection department.

Then, with the public mind prepared and in a responsive condition, the city council can be approached. It should not be difficult to find a sponsor in that body because of the public support and the assurance that the proposed legislation contains no bugs.

Such legislation will be more apt to be quickly enacted and less subject to attack.

#### KEEP INSPECTORS EMPLOYED

THE Los Angeles Estimators Association at a recent meeting adopted a resolution requesting the city to make no further reduction in the personnel of the electrical inspection department. This is an action we would like to see take place in every city, but after passing this resolution what are you going to do about it?

The municipalities are reducing their electrical inspection forces because the income is falling off. If the revenue to the city can be maintained or increased the inspection forces will not be molested.

If the contractors want good inspection departments, properly manned, and we assume all good contractors do, then they must help the city to get more revenue from electrical work. This can be done in many ways, some of which are as follows:

1. Report to the inspection department the names of all contractors who are taking work but who have not paid their 1933 license fee.
2. Report to the inspector all work being done by licensed contractors for which no permit has been taken out.
3. Report all work being done by unlicensed people.
4. Whenever you see work that should be corrected, report it for reinspection.

These reports will bring in more money for license fees, for permit fees, from fines.

Incidentally, it will produce a much finer relationship between the inspection office and the contractors, besides creating a better local competitive condition.

# /// code chats ///

A MONTHLY DISCUSSION OF WIRING PRACTICE AND QUESTIONS OF INTERPRETATION, PRESENTED WITH A VIEW TOWARD ENCOURAGING A BETTER UNDERSTANDING OF THE NATIONAL ELECTRICAL CODE

CONDUCTED BY F. N. M. SQUIRES  
ASSISTANT CHIEF INSPECTOR, N. Y. BOARD OF FIRE UNDERWRITERS

## BREWERY WIRING

*I would appreciate receiving your suggestions or the requirements for the wiring in breweries. Do you ask for rigid conduit throughout with lead cable in all damp, or locations subjected to condensation, such as in the cooler? Do you ask for special fittings in such locations?*

There are no special rules in the Code with special provisions for wiring in breweries. The regular Code rules are considered broad enough in their scope to deal with all conditions found in such places. Moisture, in practically all degrees, from almost nothing up to 100 per cent, appears to be the principal condition to be given the most careful attention and when this has been done the rest of the job is comparatively simple. Of course, there also are in some parts of the breweries heat conditions to be looked after and also precautions against damage by ammonia fumes. But present Code rules can be used to cover these conditions.

## APARTMENT HOUSE FEEDER SIZES FOR RANGES

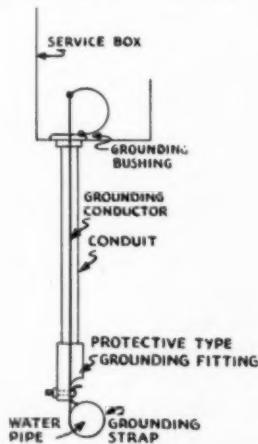
*When calculating the size of service, or feeders, in a building occupied as apartments having provision for individual cooking, it states on Page 85 of the Code that one watt is figured per square foot plus 1000 watts per apartment for appliances. If electric ranges are to be installed in each apartment do you add for the ranges in accordance with the table on Page 87 or will the 1000 watts for appliances satisfy the Code requirements for type of installation?*

In computing the size of feeders in buildings where electric ranges are to

be installed, the demand for the ranges as given in 613-d-18 (page 87) of the Code, is added to the one watt per square foot of floor area, plus 1000 watts per apartment as mentioned in 612-d, 5. This does not take care of the range load as it only covers the capacity required by appliances which may normally be expected to be used whether an electric range is used or not. If the use of a range precluded the use of all other appliances then this matter could be handled differently.

## CONNECT GROUND WIRE TO PROTECTING ARMOR AT BOTH ENDS

*Please interpret 907-1 by a sketch.*



This rule requires that where a grounding conductor is a wire and is run within a metallic enclosure, the wire is to be electrically connected to its enclosure at both ends.

Grounding fittings of what is known as the "protective type" have means for accomplishing this.

## SEALING OFF CONDUIT IN FILLING STATIONS

*A question has arisen with regard to filling station wiring chiefly in connection with wiring motor driven gasoline pumps, where motor operating switch is furnished sealed off in explosion proof fitting, by the gasoline pump manufacturer.*

Our local inspection department interpret Section 3203-c as requiring a seal-off fitting, such as Crouse-Hinds EYS, at panelboard, located inside service station and installed on run of conduit from panelboard to pump.

Our contention is that Section 3203-c first, does not require any seal-off fitting at all and second, if such a seal-off is required, then since above section states that sealing shall be done where conduit terminates, it should be in the base of the pump, which is the terminus of pump conduit run.

*Please advise if seal-off fitting is required and if required, does it meet requirements of Code by being placed in base of pump.*

Rule 3203-c certainly does require that "provision shall be made for sealing off the conduit" in a Class 1 hazardous location. The 1931 Code does fail to state that use shall be made of this sealing off provision, but it was the intent of the makers of the Code that the conduit should be sealed. And the next Code, by the way, will make this requirement quite plain. But the inference is quite evident that the conduit be sealed off and what electrical contractor would care to admit that he failed to heed the inference at an investigation following a disastrous explosion?

But part of the question is as to

*Electrical Contracting, May, 1933*

ARROW



No. 275

*New Beam Light* *and companion piece:*  
**Porcelain Wall Bracket**

*PETAL  
DESIGN*

New BEAM LIGHT pictured above shines as an artistic innovation over the old plain styles. Conventional petal design in relief, with graduated rings above, carries through the modern treatment in fixture installations. Notice shallow effect—gained with no loss of wiring-space. Easy, economical to install, and competitive-priced. Comes in white porcelain only. Pull type, No. 275; Keyless type for control by wall switch, No. 276. Fits 3 $\frac{1}{4}$ " and 4" boxes; mounting straps supplied.

PORCELAIN WALL BRACKET, Number 270 at right, deserves place as a companion piece to the Beam Light. Since introduced a year ago, SALES HAVE O. K.'d. it for harmony of design with up-to-date installations. Supplied with or without Convenience Outlet—in white, cream or green glaze; attractive shields to order. Mounting straps furnished for wall cases and 3 $\frac{1}{4}$ " outlet boxes.



**ARROW ELECTRIC DIVISION**  
 THE ARROW-HART & HEGEMAN ELECTRIC CO. HARTFORD, CONN.

# NEW BUSINESS and NEW CUSTOMERS

• If  
you sell them THIS Idea!




Apartment House Lighting Control



Floodlighting Control



Display Window Lighting Control



Electric Sign Control

Those days when they called you up every day and asked for bids have grown a little thinner now. The contractor who keeps busy and makes money these days is out of his office looking for business. And if he has a real idea to sell, he is getting business.

For example: The contractor who goes to his jobber and looks over the line of Sangamo Time-Switches—and then studies the applications for these modern devices. Such a contractor soon finds a large apartment building where he can save money for the owner and give greater tenant satisfaction by installing a Sangamo job which automatically turns hall and vestibule lights "on" and "off". How many prospective wiring and installation jobs of this kind do you drive by every day?

Every outdoor sign is a prospect, too. The companies operating these signs save time, money and avoid complaints if their sign and flood lights are automatically controlled by the Sangamo Time-Switch and Astronomic Dial.

Spend an hour with your Sangamo jobber—before the day is over you will have thought of more prospective users than you can call on in a month. Then call on them! Remember, there is an installation and wiring job that goes with every Sangamo Time-Switch.

In addition to those illustrated, there are 12 major markets for contractor installations.

**SANGAMO ELECTRIC CO.**  
SPRINGFIELD, ILLINOIS

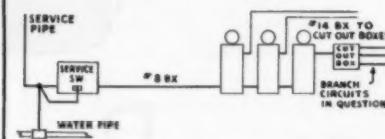
just where the sealing is required. If one end of the conduit terminates in a panel which is located in a room which is not in the hazardous area, that end need not be sealed. But at all junction or switch boxes or motor terminals in the pump the conduit must be sealed. It can thus be seen that several seals may be required on a circuit run.

#### GROUNDING ARMOR OF BRANCH CIRCUITS

When the service conduit is grounded as shown below, does it automatically ground the armor of the branch lighting circuits?

I do not see anything in the Code that states that the armor of the branch circuits run in metal must be separately grounded, even if some distance from the service conduit.

The service switch and meters are in the cellar and the cutout box is in the back shed of each floor.



The Code does not require that the cables running from the meters or cutout boxes be separately grounded. Section 904-a requires that all metal clad runs be grounded, and the intent of the Code is that if all connections are made up tight as required by Sections 503-g, 504-f, 505-f, etc., the remote runs are sufficiently grounded by the grounding connections at the service.

#### SIZE OF GROUND WIRE DEPENDENT UPON FUSE SIZE

In 907-n what is the meaning of the rule that the capacity of the fuse ahead of the conduit, etc., governs the size wire or pipe to ground interior raceways, etc.

I should think that the branch circuit fuse is always the one ahead of the raceway, etc., which would always be 15 amp. or less.

The fuse to be considered is the one giving immediate protection to the conductors within the armor which is to be grounded.

In the sketch above (for grounding armor of branch circuits) the fuse to be considered is the service



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Black Enameled - Electro or Hot Dipped Galvanized

# BUCKEYE CONDUIT

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SHEET AND TUBE CO.  
YOUNGSTOWN, - - - OHIO

In electrical installations whether  
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use Youngstown Buckeye Conduit  
for best results.

# An Outstanding CIRCUIT BREAKER

## For Tamper-proof, Fuseless Protection of Building and Industrial Circuits

**I**N THIS new circuit breaker, G-E designers have employed a unique principle of circuit interruption. Result: *no external arc*. The contacts are in a closed chamber, which effectively confines the arc when the breaker opens. Thus confined, the arc is broken under pressure, which results in remarkably high speed of interruption—.008 of a second. It is absolutely quiet except for the click of the mechanism.

The performance is further aided by a quick make-and-break contact mechanism.

### Application

In panelboards and other load centers, instead of fuses and fused switches; in service entrances, instead of fused switches; in dead-front switchboard assemblies; and for individual circuits and appliances.

### Advantages

This circuit breaker prevents over-fusing and "bridging." The tripping (thermal overload) element is sealed and can not be tampered with.

It makes possible prompt restoration of service; no need to spend time locating blown and spare fuses. The target shows which breaker has opened. Power is restored by simply moving the handle.

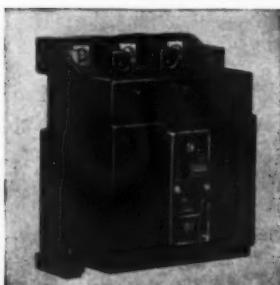
It assures safety. When properly installed, there are no live parts exposed. There is no external arc during circuit interruption.

### Ratings

Up to 600 volts, alternating current, and 250 volts, direct current; 15 to 600 amperes; single-, double-, and triple-pole.

*Mail the coupon to the nearest G-E Office or to General Electric, Dept. 6A-201, Schenectady, N. Y.*

Triple  
Pole



General Electric, Dept. 6A-201, Schenectady, N. Y.

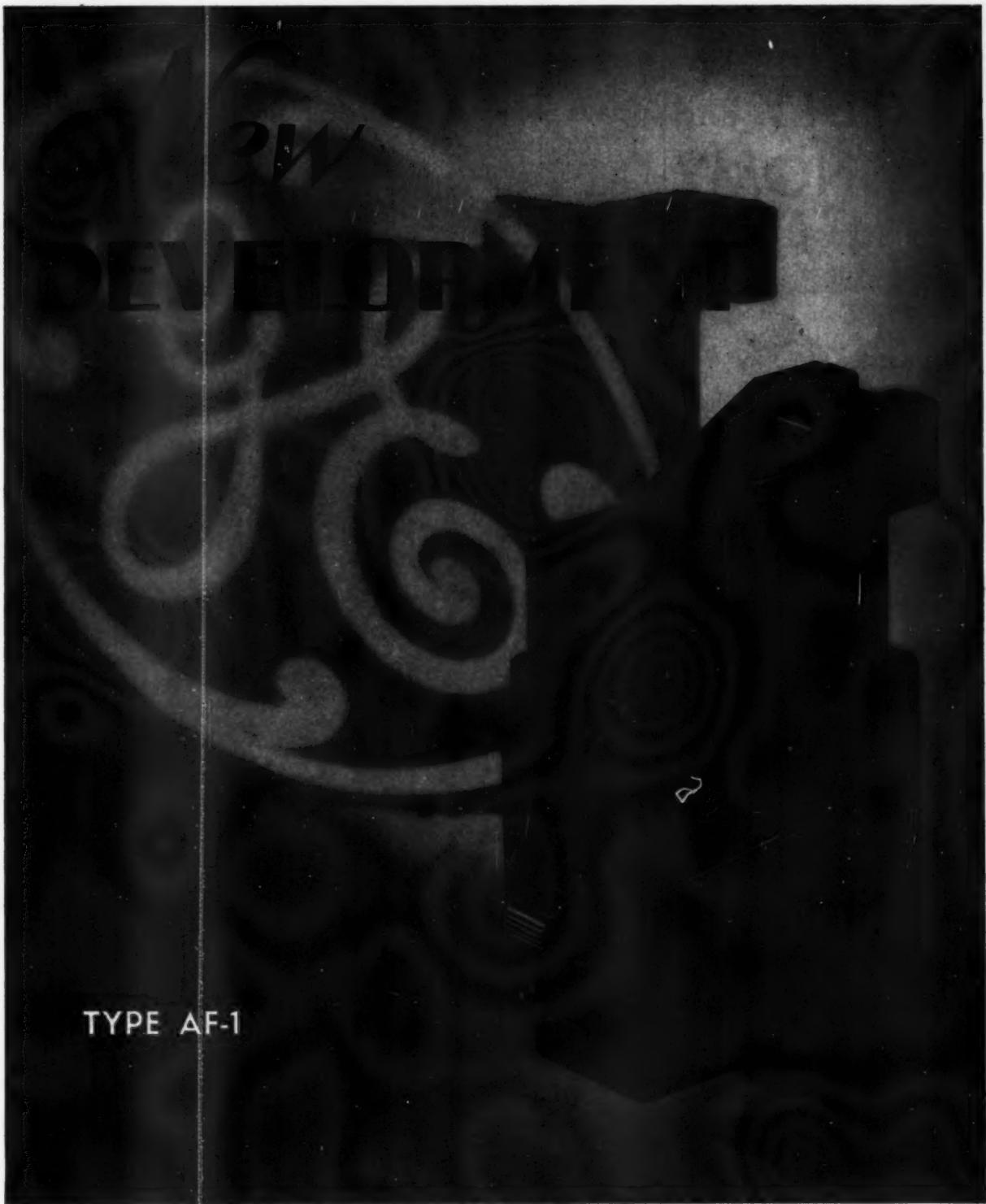
I should like to know more about the AF-1.  
 I should like to see a sample.

Name.....

Company.....

Address.....

490-15



*Illustrations (above and on preceding page) show single-pole and triple-pole breakers, 15- to 50-amp. size; height of each is 6 inches*

GENERAL  ELECTRIC

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# Greater SAFETY and ECONOMY for users of portable cords plus a profit for the contractor

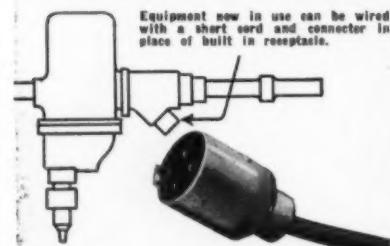
The complete line of receptacles includes flush types with heavy brass plate, as well as conduit body types.

Plugs and connectors have cadmium plated heavy-gauge steel shells to withstand rough handling.

Every user of portable electrical equipment will recognize the safety features of high-voltage insulation, proper grounding, full enclosure of live contacts, and sturdy construction in this new line of Pyle-National plugs and receptacles. Approved for 20 amperes, 250 volts D.C., 460 volts A.C., yet economical for 110 volt service. They reduce cord and connector repairs, lost time, and accidents. Big users of portable tools who know costs are already changing over to these new-type plugs and receptacles.

You can deliver real advantages to your customers, and make a very satisfactory profit on every installation. Ask your jobber about Pyle-National explosion-proof fittings, heavy-duty plugs and receptacles, and safety switches, or send the coupon for bulletins.

**The Pyle-National Company**  
1334-58 North Kostner Ave., Chicago, Ill.



## MAIL THIS COUPON

for Bulletin 179 and list of uses.

Address The Pyle-National Company, 1334 N. Kostner Ave., Chicago, Ill.

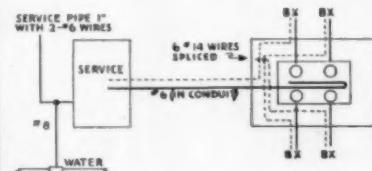
Name \_\_\_\_\_  
Address \_\_\_\_\_

Check here for general catalog.

fuse which in the case of the No. 8 feed from service to meters would be 35 amp.

## ANOTHER GROUNDING PROBLEM

*Is it permissible to do a job like this?*



*If No. 8 wire was used to ground the wiring system and service pipe would this pass inspection? The branch circuits are connected to cutout box. The BX is connected to cutout box by squeeze connections, so the electrical connection is through the cutout box and BX that supplies it, to service switch box and service conduit to ground wire.*

Yes, the layout sketched is within the requirements of the Code when the service cable and system neutral is grounded with No. 8 wire.

## INDUSTRIAL LIGHTING REQUIREMENTS

*In connection with industrial lighting, we have had considerable argument over the Code requirements on several points involved in a contemplated job. Hence, we are stating the case and asking several questions, with the hope of getting these points definitely settled by an interpretation by you. The case is as follows:*

*A room 90 by 180 ft. is to be lighted with 9 rows of lights, each row having 12-150 watt outlets. The branches are all in conduit and fed from a 110-220 volt grounded-neutral panel at the center of one side wall.*

*The original plan involved 18 circuits, each row being composed of 2 circuits of 6 outlets each, using No. 10 wire to reduce the drop.*

### Common Cross Feeder

*1.—Instead of taking out 2 black and 2 white wires for each row, would it be within the Code to use only one grounded cross-feeder for each row of two circuits, the common white wire then running the full length of the row?*

Yes, this is permissible. The "one common cross feeder for each row of two circuits" simply constitutes a 3-wire 110-220 volt circuit. There would then be 6-150 watt lamps on each side of this 3-wire circuit.

### Change of Wire Size

*2.—Is it permissible to run the cross-feeders in the original plan in No. 8 and then drop to No. 12 for the branches, provided the circuit is fused at 20 amp. for the No. 12?*

This would be permissible except for the size of the fuse. The idea here is to use a wire larger than No. 14 in order to reduce the drop on the circuit. This part is all right whether the wire is a No. 8, No. 10, or No. 12 but in any case the branch circuit fuse must not be larger than 15 amp. The use of No. 12 wire does not allow a branch circuit fuse to exceed 15 amp. as called for in 807-d.

### Double Pole Switches

*3.—Is it permissible to use double pole switches and run out a 110-220 circuit of 3 No. 12 for each row of 9 outlets, the three wires running the full length of the row and having outlets on alternate sides of the neutral?*

Yes. Again remember that the branch circuit fuses must not exceed 15 amp. on this 3-wire No. 12 circuit.

### Single Pole Switches

*4.—Would it be possible to use the general plan of the preceding question, but with an ordinary 110-220 panel with grounded neutral and single pole switches, to permit the use of every other light in each row?*

Yes.

*Further comment: The wires are run in conduit from a panel at the center of one side wall. It would be possible, then, to supply 4 rows with 9 wires run within the one conduit. For this arrangement the 8 unidentified (hot) wires would run directly from their own respective switch to the row. But the neutral to feed these 4-3 wire circuits (the equivalent of 8-2 wire circuits) would be a single common neutral. This would leave the panel as a No. 6 but after the first row had been tapped off it could become a No. 10. After two more rows had been tapped off it could become a No. 14 to feed the last row.*

# Splicing Supplies



**IN UNIT PACKAGES** for all lead cable work open the door to a comfortable profit, with a simplified inventory. This **GENERAL CABLE** innovation has been enthusiastically received as a saver of materials, time and money . . . Each package contains a complete but non-wasteful assortment of matched supplies for one splice in a lead sheathed cable, whether rubber, varnished cambric or paper insulated . . . Avail yourself of this new idea. It will pay you . . .



*..and*  
**INSULATING  
COMPOUND**



## OZITE

names an Insulating Compound which enjoys nation-wide preference for its convenience of use, and the consistent, high electrical efficiency of joints, junction boxes and terminals so sealed. OZITE B is the general purpose grade—for normal temperatures and voltages to 25,000. It has ideal characteristics from both the electrical and field use viewpoints. It penetrates thoroughly at pouring temperatures. Ask for the Ozite Story.



## GENERAL CABLE CORPORATION

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• OFFICES IN PRINCIPAL CITIES

# N.E.C.A.

## NEWS AND SERVICE INFORMATION

MATERIAL FOR THIS DEPARTMENT IS SUPPLIED BY THE HEADQUARTERS STAFF OF THE NATIONAL ELECTRICAL CONTRACTORS ASSOCIATION  
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Vice President, Earl N. Peak  
1603 West Main Street, Marshalltown, Iowa

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Contractors Organized for Industry Welfare

### N.E.C.A. CONTACTS BANKERS ASSOCIATION

Through the N.E.C.A. headquarters, contact has been made with the American Bankers' Association to develop a program of cooperation with the bankers of the country in the modernization and renovation of real estate properties, in which the banker today holds the key to a tremendous market.

The banker has become by necessity the largest property owner and landlord in the country, and his interest in the problem of making those properties pay out is one of the most vital facing him today.

The banker is alive to the importance of modernization and renovation of real estate properties for the protection of his investment and the ultimate return of these properties to individual ownerships. He is faced with three immediate factors:

1. The known deterioration of properties during four years of depression.
2. The impossibility of deriving a satisfactory income from antiquated properties.

3. The necessity for protecting equities of properties in distress.

It is estimated that the bank-owned real estate as of June 30, 1932, totalled \$2,218,000,000, and their interest in mortgaged properties represents over \$15,000,000,000.

The indices of the Federal Reserve Bank of New York and of the F. W. Dodge Corporation present to the banker the situation with regard to building costs at the present time. Taking the year 1926 as normal with the index number of 100, the 1932 index stood at 82, building wage rates having an index of 94 and building material costs an index of 72. These ratios have been materially lowered in the past six months.

In every bank there is an officer in charge of real estate, or a senior officer who acts with his finance committee in the administration of the properties in which the bank has a direct interest.

These bank officers in charge of real estate are already modernization minded. Their problem is to handle the bank's properties with maximum benefits to their bank. Their

experiences have convinced them that only property with modernized equipment is rentable and salable.

The opportunity lies ready made at the hands of the electrical industry to reach through these banks in every community, a tremendous field of modernization work in bringing antiquated properties up to modern electrical requirements.

Electrical contractors should prepare themselves with the data that these bankers are seeking, to show how increased adequacy of electrical installations in antiquated properties, whether stores, hotels, office buildings or residences, will increase their rentable and salable values and show a return upon the cost of such improvements greater than any other investment the bank can make.

### PUSHES SEPARATION BILL

Following favorable action by the Executive Committee, President Mayer has appointed John W. Hooley of New York City, to represent the N.E.C.A. on a Joint Legislative Committee of the several "mechanical trades" national associations, to promote the bill which has now been introduced in both the United States Senate and the House of Representatives to provide for the separation of contracts for electrical equipment, plumbing, gas fitting, steam and hot water heating, ventilating, etc., from the general contracts on government projects.

The other members of the Joint Legislative Committee are Ray L. Spitzley, representing the Heating and Piping Contractors National Association, and Robert J. Barrett, representing the National Association of Master Plumbers. Joseph C. Fitts, secretary of the heating and piping group, is acting secretary of the joint committee.

The separation bill was introduced in the house by Representative Carley, and is known as H.R. 113. A similar bill was later introduced in the senate by Senator Barbour, where it is known as S.1066.

Elimination of the abuses incident to dealing through a broker and to substituting a broker's credit for the government's credit should call for the support of all electrical contractors for this legislation. Direct dealing with the government will eliminate abuses with which every electrical contractor is familiar. It will

# TROUBLESONE CABLE TAPPING OPERATIONS

## now simplified with the new patented

### Hixley ANCHOR TAP



Showing assembled Anchor Tap with tap cable at **RIGHT ANGLES** to main.



Cap removed showing tap cable **PARALLEL** to main, with bushing in place, fully insulating tap lug.



View with top half removed showing the "floating" feature for flexibility in installation.



Conductive interior, showing method of mechanical connection as well as rugged stud to which tap lug connects. Note the Hollow Cap Screws (see arrow) which insure a faster firmer set-up than is possible with the ordinary screw and screw-driver.

#### ADJUSTABLE, RUGGED SIMPLE

The Hixley ANCHOR TAP has been designed primarily for ease and simplicity of installation. The full "floating" feature permits flexibility, allowing for entrance of the main cables at other than right angles.

The square cap and its universal mounting allows the tap cable to run right or left; top or bottom. And in addition, a knockout is provided in the cap so that TWO taps may be taken if required.

#### CABLE SUPPORT:

The heavy steel mounting plate is drilled for fastening—and thus provides support where required, for the cable run.

The moulded parts are of special composition of great strength—more than sufficient for adequate support of heavy cables.

The tenacious grip of corrugated surfaces on the cable strands, secured by positive clamping, insures perfect electrical and mechanical connections.

**Special Folder on Request**

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A GENERAL ELECTRIC  ORGANIZATION

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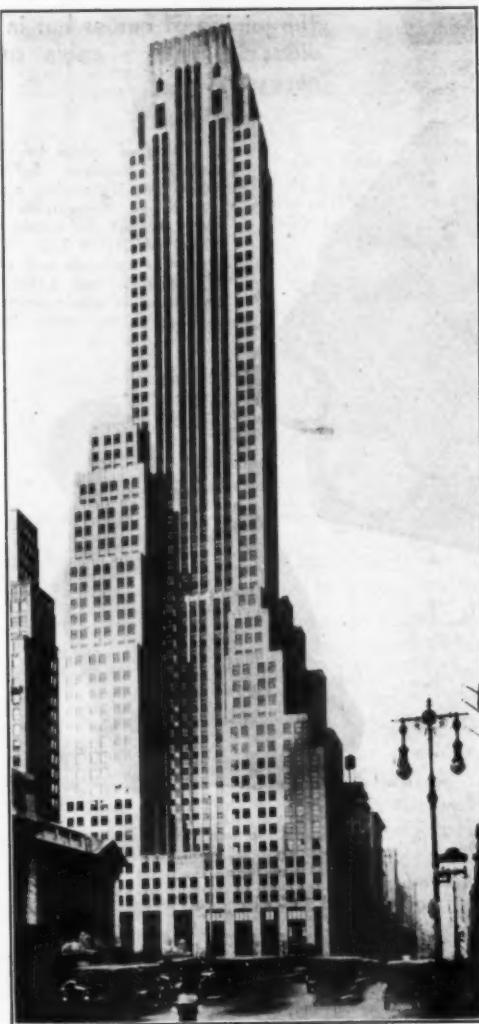
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DEVICE CORPORATION**  
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make possible governmental economies in the building program which are of equal advantage to the government and to the public at large.

The Joint Legislative Committee of the national associations can represent you at hearings before senate and house committees, but the greatest influence for the passage of legislation lies in indication of the wishes of the industry generally, directly expressed to the members of congress.

If these bills are to be passed by this congress, your representatives in congress must be made aware that this legislation is sorely needed. You are fully justified asking your State and district representatives in congress to give their wholehearted support to these bills for separation of contracts,—H.R. 113 and S. 1066.

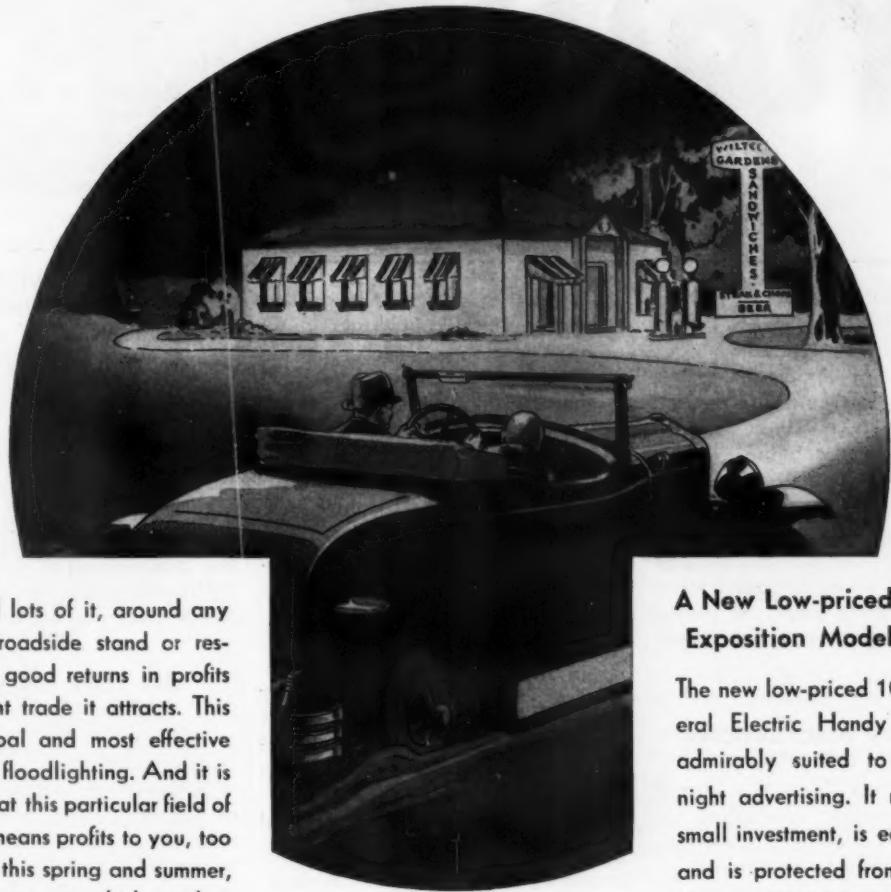
### NEW DIRECTOR OF FEDERAL CONSTRUCTION

President Roosevelt has announced the appointment of L. W. Roberts, Jr., of Atlanta, Ga., as the new assistant secretary of the treasury, to replace Ferry K. Heath. Mr. Roberts has been a member of the firm of Roberts & Company, architects and engineers, of Atlanta, and is himself an electrical engineer.

It is hoped that this appointment opens the way for a "new deal" for the building construction industry in the handling of the construction program of the Federal Government, responsibility for which rests very largely in the assistant secretary of the treasury. Mr. Heath, who formerly occupied this position, has not been sympathetic to the pleas of all groups of subcontractors for relief from the abuses of broker general contractors.

The construction industry turns to Mr. Roberts with hope and confidence that through his personal knowledge of the building industry and the disastrous conditions grown out of past practices, he will be able to formulate a program for handling the construction program of the government so that the legitimate businesses among responsible subcontractors and general contractors alike may be able to benefit, which in turn means that labor and material men will be protected and the avowed intent of the government's program to stimulate prosperity will be assured.

# "WHOA! Let's stop here IT MUST BE A GOOD PLACE"



**L**IIGHT, and lots of it, around any kind of roadside stand or restaurant pays good returns in profits from the night trade it attracts. This is the principal and most effective argument for floodlighting. And it is the reason that this particular field of application means profits to you, too—especially this spring and summer, when so many new roadside gardens and restaurants will be springing up.

Light is the best method of night advertising. No matter how striking the architecture or signs may be, they are valueless at night, unless they can be seen.

A well-lighted roadside establishment can be seen far enough away to enable the motorist to slow down and pull out of traffic before he reaches the drive. Light then invites his confidence, and he feels more certain that his car will be safe while he is inside.

500-watt general service MAZDA lamps. Then there are the smaller members of the G-E Handy family: the 200-watt G-E Senior Handy and the 100-watt Junior Handy.



The NEW Exposition Model Handy

### A New Low-priced 1000-Watt Exposition Model Floodlight

The new low-priced 1000-watt General Electric Handy Floodlight is admirably suited to this form of night advertising. It requires but a small investment, is easily mounted, and is protected from the elements by a heat-resisting glass lens. It can be used with either 1000-watt or

For further information about the new floodlight, or for recommendations and plans for any floodlighting installation, address the nearest General Electric Supply Corp. office, or G. E. office; or General Electric, Dept. 6-201, Schenectady, New York.

710-177

# GENERAL ELECTRIC

# CONTRACTING

## news

INFORMATION OF INTEREST TO ELECTRICAL CONTRACTORS  
CONSISTING OF ITEMS OF NEWS, SHORT ARTICLES, PRACTICAL  
IDEAS, ETC., OUR READERS ARE INVITED TO CONTRIBUTE TO  
THIS DEPARTMENT

### REINSPECTION CREATES \$42,000 ELECTRICAL WORK

Reinspection in Portland, Ore., from January 11, 1932, to April 1, 1933, covering the inner fire district, resulted in 391 permits issued covering electrical work, totaling \$42,837.

A total of 3580 inspections were made resulting in 528 complaints of defective wiring in 111 buildings, besides numerous minor defects and adjustment of fuses to proper sizes. Only one building inspected passed without needing some repairs or adjustments.

### NEW YORK ASSOCIATIONS FORM COUNCIL

Representatives from the several electrical contractor associations of Greater New York City at a meeting on April 8 formed the Council of Electrical Contractor Associations of Greater New York for the purpose of handling the major problems of the local contracting industry.

The immediate activities of the Council will be directed toward the enforcement of the local code and clarification of the rules under which special licenses are issued. The Council will also investigate ways in which the city code may be made more effective in the safeguarding of life and property.

A code and legislation committee, with representatives from associations in each of the five boroughs, has been appointed with Irving Gaynor as chairman.

The activities of the Council are expected to go a long way toward the elimination of bootleg wiring and is looked upon by the members of the cooperating organizations as the

most progressive step taken in the interests of local contractors in the last decade.

The officers of the Council are: A. Lincoln Bush, chairman; Louis D. Kennedy, first vice-chairman; Harry G. Barth, second vice-chairman; Daniel E. Bergin, third vice-chairman; Arthur C. Egbert, fourth vice-chairman; Hans Brockmuller, treasurer, and George W. Neil, secretary.

### ELECTRICAL GUILD CEASES EXISTENCE

The liquidation committee of the Electrical Guild of North America has released the following announcement as to the status of that organization:

At the annual meeting of the Electrical Guild of North America held in May, 1932, a committee consisting of A. C. Brueckmann, treasurer, and G. E. Stewart, secretary of the Guild, was appointed to make certain rebates to the members. This the committee has done, and there being no assets remaining, cash or otherwise, the Electrical Guild of North America has ceased to function and has passed out of existence.

### MODERNIZATION PROGRAM PLANNED BY N. J. LEAGUES

At the quarterly meeting of the New Jersey Council of Electrical Leagues held April 6 at New Brunswick, N. J., an electrical development plan was presented which will place at the disposal of the public in all sections of the state newly developed electrical apparatus and appliances. The program calls for the modernizing of the home, office and factory, including industrial, commercial and residential lighting, power and the safest and most economical appliances obtainable.

Twenty-five delegates from seven member leagues were present and representatives of two other leagues now in the process of formation reported that application would soon be made to the council for membership.

Presidents of organizations representing the electrical industry in all parts of the state reported on the activities of their local associations.

The officers of the council are Harold P. Litchfield, president; J. H. McQueston, vice-president; Edward A. Gardner, treasurer, and Wm. Rae Crane, secretary.

### FAVORS No. 2 SERVICE IN DISTRICT OF COLUMBIA

The members of the Electrical League of Washington, D. C., at their meeting on April 6, unanimously went on record as favoring larger intake service in the District of Columbia.

The league voted that minimum service requirements for safety and convenience should consist of three No. 2 wires in 1½-in. conduit.

Present standards call for three No. 8 wires in 1-in. conduit.

### NEW YORK UNAPPROVED MATERIALS CAMPAIGN

A campaign of education and publicity directed toward the elimination of unapproved electrical goods carried by retail stores in the New York metropolitan area is being sponsored by the New York Chapter of the International Association of Electrical Inspectors.

A sponsor committee to formulate the policies, select the working personnel and guide the activities of the various committees has been selected from the municipal inspection department, New York Board of Fire Underwriters and the local utilities. The members of this committee are J. C. Forsyth, C. W. Platt, Nicholas Kelly, F. N. M. Squires, Bart Green and J. W. Hager.

The various activities of the campaign have been assigned to three operating committees as follows:

Contact and Inspection Sub-Committee: The purpose of this committee is to select the properly equipped men from the New York Chapter of the I. A. E. I. to interview dealers in electrical devices and materials and to instruct them in the proper method of approach.

Meetings, Program and Sub-Committee: The primary purpose of this committee is to arrange with civic and com-

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to  $\frac{1}{4}$  HORSEPOWER**

● Many years ago this company said, "A motor is a machine having electrical functions." And motor users agreed—for they knew that by far the greatest number of motor failures were mechanical failures. Failures of bearings, failures of insulation, loosening of laminations and others.

*Mechanical excellence* — became the goal of F-M engineering. First, the pioneering of the ballbearing motor. Then, improvement after improvement which have made the F-M Motor the preferred motor wherever a thorough investigation of quality is made.

Today, this quality and longer service at less maintenance cost is available for practically every requirement from the F-M 10,000 hp. motors to the  $\frac{1}{4}$  hp. motors.

Contractors are finding their recommendation of F-M Motors and an explanation of their advanced mechanical construction a positive means of securing customer good will.

We will gladly supply contractors with bulletins describing these motors in detail. Fairbanks, Morse & Co., 900 S. Wabash Ave., Chicago, Illinois. 32 Branches at your service throughout the United States.

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We illustrate F-M engine type synchronous motors; F-M wound rotor induction motors; F-M high speed synchronous motors; F-M vertical induction motors, weatherproof type; F-M fan cooled, enclosed type; F-M enclosed pipe ventilated motor; F-M d.c. motor and F-M single phase motors.

**FAIRBANKS-MORSE**  
MOTORS



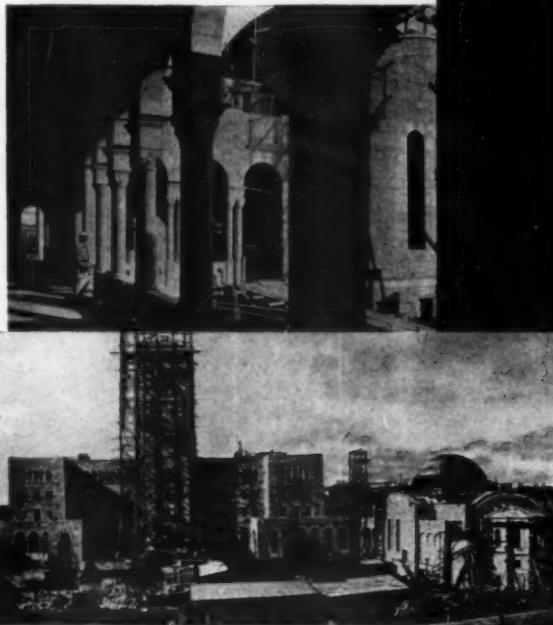
POWER PUMPING AND WEIGHING EQUIPMENT

5803-EA40.52

# Even in far-off JERUSALEM they prefer this conduit

NEW Y. M. C. A. BUILDING IN JERUSALEM

Wiring protected by  
Fretz-Moon Rigid  
Conduit



TRAVEL all over the world and you will find contractors of every race and nationality who insist on Fretz-Moon Conduit—the only conduit made by the "continuous process." • Use it once, as they have done, and from then on you'll prefer it, too. You'll appreciate what uniformity, sharp threads, easy-working qualities and wear-resisting enamel and galvanizing can mean in time and expense saved on the job. • Fretz-Moon Conduit is made in three finishes—black enameled, electro-galvanized and hot-dipped galvanized. It meets all code specifications.

**FRETZ-MOON TUBE CO., Inc., BUTLER, PA.**

# FRETZ- MOON Rigid conduit



**OPERATES IN TWO CITIES:** Sam D. Ellis, head of the Missouri Electric Supply Co., operates in the cities of Columbia and Fulton, Mo. He has been in business in that territory for over 18 years and his firm has done its share of the bigger work. They recently wired the new city hall in Columbia.

mercial groups for capable speakers to appear before them for the purpose of discussing various phases of the educational and publicity movement. Another important function of this group is to prepare speaking programs for public consumption in connection with the Electrical Association and other interested parties.

The Publicity and Finance Committee: This committee has been assigned the function of preparing and releasing all news relating to the movement that will further the purpose of the educational and promotional program and to foster the good will of the daily and trade press. It is to work closely with the large factors in the electrical retail trade in order to secure their cooperation in fostering the movement through advertising. One of the important functions is to conduct direct-mail campaigns among the various industry groups and pave the way for speaking engagements.

Merchandise which has not received approval of Underwriters' Laboratories but which complies with such standards will be acceptable, if such compliance is certified by some other recognized organization which is equipped with proper facilities for examining and testing such merchandise and with facilities for following up this material in the field.

## REINSPECTION ORDINANCE PASSED IN TUCSON

An ordinance providing for frequent reinspection of all places where unusual hazards prevail, such as auto service stations, garages, hotels, hospitals, schools, churches, theatres, auditorium and other places where

an assemblage of 60 or more people may gather, has just been passed in Tucson, Ariz. Where the electrical installation is found to be in good shape, the inspection department issues a ticket of approval.

#### STANDARD TELEGRAPH CODE FOR ELECTRICAL INDUSTRY

L Code, a standard telegraph code for the electrical industry, sponsored by National Electrical Manufacturers' Association and the Edison Electric Institute (formerly N.E.L.A.), has been published by the Business Code Company, Inc., 2 Rector St., New York City. The manuscript was carefully checked by the leading electrical associations to insure its adaptability to all branches of the industry. It covers all words and phrases commonly used in the purchase, sale and maintenance of electrical equipment and supplies.



**TEAM WORK:** A. L. Rowe, of the Rowe Electric Co., Great Falls, Mont., has been teaming up with G. A. Mehl Plumbing Co. since 1928. They have a shop and office together with small displays, but do not go in for the merchandising business. Rowe is a contractor only, and specializes in the larger work. They have found that one business feeds the other to a considerable extent and there is the added advantage of less overhead. As evidence of the class of work that the Rowe Electric Co. does, it recently completed the electrical work on a million dollar high school building which represented approximately a \$60,000 electrical job; a pumping plant and automatic control switchboard for nine motors aggregating more than 2,000 h.p.; a \$25,000 electrical job; and a grade school on which the electrical work was about \$2,000. This is good business for any contractor in a city of 28,000 population. Rowe is at the left.

## A NEW EXIDE PRODUCT

*The new Keepalite Emergency Lighting System is . . .*



## ...A BIG 2-WAY PROFIT MAKER



Keepalite operates instantly and automatically. Adequately lights areas of 10,000 sq. ft.

**Keepalite can be sold now in your community. It is the money maker you've been wishing for!**

**I**N spite of every precaution of the Utility Companies, they cannot prevent service interruption due to storms, street accidents and troubles within the premises. Outages do occur more frequently than realized, throwing whole communities into darkness. In crowded school auditoriums, hospital operating rooms, theatres, etc., lighting interruptions can easily result in injury, serious damage or loss of good-will. That is why KEEPALITE Emergency protection can be easily sold to protect such buildings. The Market for KEEPALITE at its unusually low price is almost without limit! This is demonstrated by the fact that thousands of larger Exide Emergency Lighting Battery Systems—costing 5 to 25

times as much as KEEPALITE—have already been sold throughout the country.

KEEPALITE fills a definite need in every community. Emergency Lighting protection is needed regardless of the times. KEEPALITE can be sold now! Have you ever before had a product to sell which offered a greater opportunity to render a vital service and at the same time make substantial profits?

**Keepalite**  
REG. U.S. PAT. OFF.  
Emergency Lighting System  
THE EXIDE WATCHMAN

### Keepalite Prospects

Hospitals  
Schools  
Theatres  
Banks  
Engine Rooms  
Stores & Markets  
Swimming Pools  
Restaurants  
Apartments  
Hotels  
Institutions  
Jails, etc., etc.

### MAIL THIS COUPON TODAY

THE ELECTRIC STORAGE BATTERY CO.,  
19th & Allegheny Avenue,  
Philadelphia, Pa.

Please send me your FREE Contractor's Booklet describing Keepalite—the NEW 2-Way profit maker.

Name.....

Address.....

**THE ELECTRIC STORAGE BATTERY COMPANY, Philadelphia**  
The World's Largest Manufacturers of Storage Batteries for Every Purpose  
Exide Batteries of Canada, Limited, Toronto

### OKLAHOMA CITY CONTRACTORS AND WHOLESALERS MEET

On March 24 the Oklahoma City electrical wholesalers were guests of the members of the Oklahoma City Chapter of National Electrical Contractors Association at a "stag" party. These get-together meetings are held quite often and have helped to form a closer alliance between the contractor and wholesaler.

### LEAGUE TO COOPERATE IN MODERNIZATION DRIVE

The Electric League of Indianapolis, Ind., will take an active part in the modernization drive which is being conducted in Indianapolis, Ind., under the sponsorship of the Chamber of Commerce. This drive is for the purpose of stimulating business and building activities, and the league plans to see that electrical contractors receive their share of the business resulting from this drive.

The city has been divided into twenty sections, each section to be in charge of a captain. Each section is to be divided into smaller units under the charge of a lieutenant who will have, under his supervision, a particular territory where workers will call from house to house, asking the householder to do some kind of repairing or modernizing this spring. If they desire this work done, they are requested to state to what extent in amount of dollars and sign a pledge card for that amount.

These cards will be left at the city hall for the inspection of all contractors in Indianapolis without any partiality being shown.

### CEDAR RAPIDS OFFICERS

The following officers were elected to serve during 1933 by the Cedar Rapids (Iowa) Chapter of Electrificationists: W. L. Fowler, Fowler Electric Co., president; T. Shea, C. R. Electric Supply Co., vice-president; Charles Kosek, Kosek Electric Co., treasurer, and C. R. Butterfield, H. J. Robertson Electric Co., secretary.

### DALLAS GETS REINSPECTION

The new electrical ordinance of Dallas, Tex., provides that the building inspector "shall make periodically a thorough reinspection" of the installation of all electric wiring, electric device and electric equipment in-

stalled within the city. The ordinance also empowers the inspector to disconnect any defective installation.

### MADISON ASSOCIATION NEW OFFICERS

The following officers were elected by the members of the Madison (Wis.) Electrical Contractor-Dealer Association, at their annual meeting on March 14: L. W. Burch, president; Albert J. Endres, vice-president and William C. Schlosser, secretary and treasurer.

### CONCENTRIC WIRING IN ENGLAND

At this time when a modification of the concentric wiring of Europe is being promoted for use in this country it is interesting to note the extent of its use in England. The following is reprinted from a recent issue of *The Electrical Times*:

#### WIRING WITH A BARE OUTER

A very interesting case has arisen at Fort William (Scotland), in connection

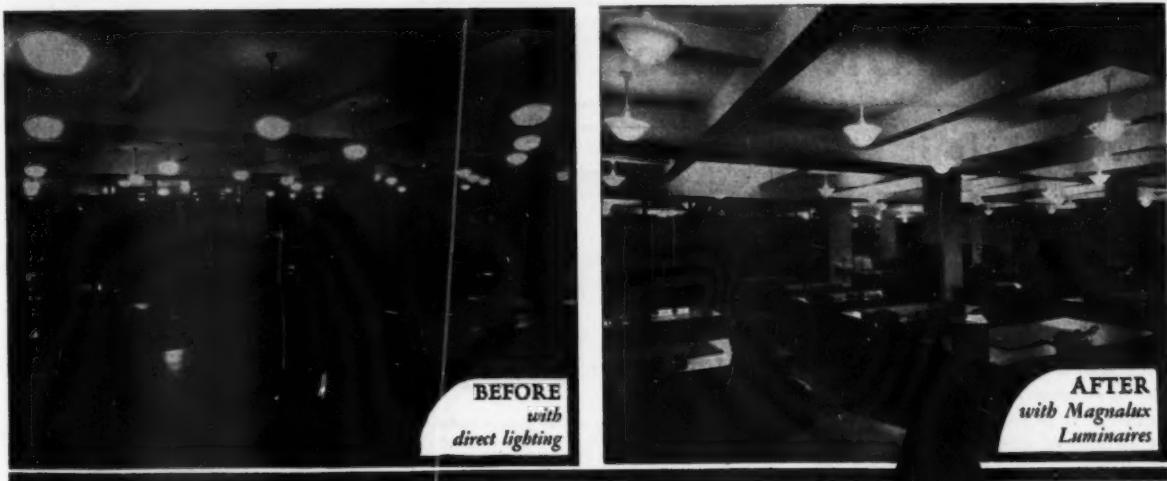
with local house wiring. Fort William is one of those exceptional instances where only one of the two poles is insulated, the other may be bare. This system has been allowed to survive from ancient times; the little hydro-electric station at Fort William was the first in Scotland, and presumably a concentric system of wiring has predominated, with the outer earthed. We remember that a similar method was tried at Egham a few years ago; we are not sure that the Engham supply undertaking ever received official sanction for the scheme, but at all events it was allowed and there was no attempt to keep it secret. Whether any of it now remains we do not know.

Reverting to Fort William, the Post Office have now complained so much of the effect of leakage on their telephone lines that the Electricity Commissioners have had to withdraw the approval formerly given by the Board of Trade to the bare neutral. This imposes a very severe hardship on all users of electricity, for the Fort William Electric Lighting Company has notified them that all wiring must be reformed by August 31st, otherwise supply will be cut off.

A public meeting was called and it was stated that the Post Office could protect their lines at a cost of less than £200, whereas consumers of electricity would have to disburse several thousands of pounds. We cannot vouch for the accuracy of these figures, but if Fort William represents the only remaining in-



**MODEL BOARD FOR SELLING RED SEAL TO FARMERS:** J. D. O'Connor, electrical superintendent for Lupen & Hawley, Sacramento, Calif., electrical and plumbing contractors, supervised the work of installing a model Red Seal board at the California State Fair for Frank Kiefer, northern region manager for the Pacific Coast Electrical Bureau. Mr. Kiefer, himself an old time electrician and foreman for the H. C. Reid Co., installed the distribution system for the world's fair in San Francisco in 1915. He devised a novel way to sell a quality job of residence wiring by the knob and tube method and to sell the Red Seal plan of wiring adequacy to the throngs who visited the state fair. On the front of the board was a typical bungalow floor plan, with actual outlets installed where required by the plan, and small lamps to indicate lighting outlets. By means of switches the board could be operated in demonstration. The rear of the board was wired in knob and tube, exposed so that it could be shown to visitors. Here the necessity for having a competent electrical contractor install the wiring was pointed out to the farmers who often think they are mechanics enough to put in their own job.



# Effective Lighting THAT SELLS MODERNIZATION JOBS

OWNERS of old buildings today realize that their lighting must be brought up-to-date if they are to attract and hold desirable tenants. Yet, in many cases they are unable to modernize because of the high cost of rewiring and the increased number of fixtures.

The new Westinghouse fixture . . . the Magnalux luminaire overcomes this barrier to re-lighting business.

Look at the pictures above. Compare the Magnalux lighting with that from a type of fixture in common use today. Note the greater amount of light . . . the more inviting appearance of the Magnalux units. Yet, there are the same number of fixtures in each case, installed on the same wiring, and using the same 200-watt lamps.

The difference is that Magnalux luminaires, in spite of the glareless character of the illumination, are more than 90% efficient as compared with 70 to 80% for many other types. This makes it possible to supply the same foot-candle intensity with fewer fixtures . . . or to obtain more light without additional wiring or increasing the number of fixtures.

These beautiful fixtures are supplied in simple and ornamental designs to fit any style of decoration.

Send for a portfolio of literature that can help you sell Magnalux luminaires in today's most fruitful field for the Electrical Contractor . . . building modernization. Address Westinghouse Electric and Manufacturing Co., Room 2-N, East Pittsburgh, Pa.



*Magnalux luminaire—  
distinctive beauty, high  
efficiency, easy cleaning,  
and simple installation  
are advantages of this  
fixture.*

## Westinghouse

T 79522  
Quality workmanship guarantees every Westinghouse product



## Help YOUR School Board!

You can help it with  
Wiremold and make  
money for yourself!

School boards everywhere, facing reduced budgets, are seeking money saving shortcuts. Yet they dare not sacrifice the eyesight of pupils for the sake of economy. Wiremold solves this problem. It provides a simple, practical method of adding to or replacing insufficient lighting systems without expensive alterations. It is economical, yet safe—and that is why it offers to wise contractors a fine opportunity to develop quick business at a good profit.



Wiremold and a few simple fittings make it easy to revise lighting systems to keep pace with changing needs.

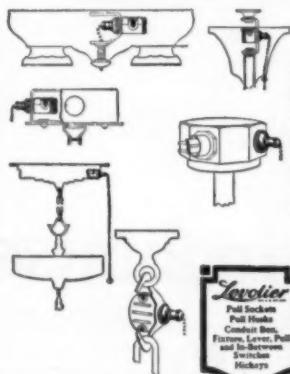
Get after this business. THIS IS THE SEASON. It is waiting for you—now! And it's yours almost for the asking. Go out and sell the Wiremold idea!

# WIREMOLD

HARTFORD, CONN.

*Levolier*  
THIN MODEL  
**WINS!**

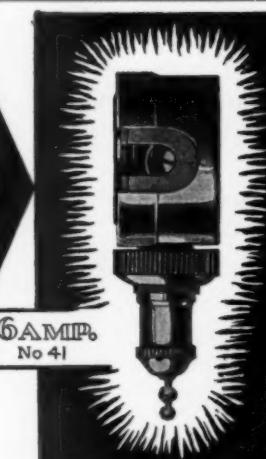
—where Service and  
Adaptability Count



The Levolier Thin model Switch No. 41 is an achievement in small switches. The above actual size picture shows it is less than  $\frac{1}{8}$  of an inch in thickness. . . In spite of its smallness, it retains all of the practical characteristics of the famous Levolier line. It is the smallest 6 amp. switch made.

At the left are shown six logical uses for this practical Levolier, which may be secured in three different stem lengths.

You'll make no mistake in ordering  
these Levolier Thin Model Switches



6 AMP.  
No. 41

**MCGILL**  
MANUFACTURING CO.  
Electrical Specialties of Quality  
ESTABLISHED 1904  
VALPARAISO - INDIANA  
Box No. 670



HE ADVERTISES: H. A. Smith (Electric Smith) of Spokane, Wash., is servicing three large oil plants on a regular basis and all three had large jobs of remodeling work recently. Smith hung the first Neon sign in Spokane. "We turn nothing down," says Smith. "We will hang a sign, build a power line or repair a socket." He runs street car ads continuously, good display space in the telephone directory and has used the radio with good results. Picture shows "Electric Smith" and Mrs. Smith.

stance in this country of concentric house wiring with an earthed outer we should much have liked to preserve it; the experience might have been extremely valuable.

We remember several bare-outer installations of about 17 or 18 years ago, when the new tungsten lamp made small house transformers popular with a pressure of 25 or 50 volts. The plan had much to recommend it, but of course isolated bare outers in separate houses are a very different thing from a whole distribution network with the neutral earthed everywhere.



GOOD RANGE RECORD: A good combination of a plumbing and an electrical contractor-dealer business is exemplified by the Cope Plumbing & Heating Co., Coeur D'Alene, Idaho. The electrical end of the business is run independently and under the name Cope Electric Co. W. M. Cope is shown at the left and with him the head of the electrical business, F. A. Furman. Furman has all the range wiring for the Washington Waterpower Co. at the uniform rate of \$40. He also sells ranges and has 200 ranges out, which is not bad for a city of 8,000 population.



## The New Deal! For Every Contractor

In these days of reduced office help and constantly rising prices contractors find that it is almost impossible to keep up to date on prices.

### A PROFITABLE PARTNER

One contractor writes: "At one time we felt we could not afford to continue your Service, but now that prices are showing an upward trend we are of the opinion that we cannot afford to be without it." By adopting the NATIONAL ELECTRICAL RESALE PRICE SERVICE you are acquiring a dependable partner always ready to help you turn losses into profits.

### BACK TO PROFITS

The opportunity to PROFIT from the use of this Service is greater today than ever, since the downward trend of prices has apparently stopped. Don't miss the profit possibilities of the NATIONAL ELECTRICAL RESALE PRICE SERVICE as your "Silent Partner" until you have investigated. Simply attach the coupon below to your letterhead and full information will be sent to you.

---

Henderson-Hazel Corporation,  
5005 Euclid Avenue,  
Cleveland, Ohio.

Gentlemen:

Without obligation please send us your booklet, "Profit—Your Silent Partner."

Name .....

Address .....

City ..... State .....

BC-5-33

**BURNDY QIKLUG**

for economy



AGENTS IN 20 PRINCIPAL CITIES

No solder, flux or flame. Cannot vibrate loose. Lower heating values than soldered lug. Installed in a minute with only a wrench. Sizes from No. 14 to 2,000,000 cm. Write to Dept. C

**BURNDY**  
ENGINEERING CO. INC.  
305 EAST 45th St. NEW YORK

**MINERALLAC**  
**PRODUCTS**

**1.**   
HANGERS FOR CABLES & CONDUITS

Easily the best for quick, low-cost installation work. Send for full details and costs.

**2.** 

**1** Hanger without Porcelain Bushing. Spring steel; stronger, quicker, more compactly arranged.

**2** Hanger attached to steel beam with bolt and nut.

**3** Jiffy Clip—quicker, neater work at less cost.

**4** Cable Joint or Pot-head Compound—8 grades for every system, underground or overhead.

**MINERALLAC ELECTRIC CO.**  
25 North Peoria Street, Chicago, Ill.

**JIFFY CLIPS**

**4.**   
Insulating Compounds

# NEWS MANUFACTURERS

A DEPARTMENT FOR THE ANNOUNCEMENT OF ACTIVITIES OF MANUFACTURERS THAT ARE OF INTEREST TO CONTRACTORS, SUCH AS CHANGES IN EXECUTIVE PERSONNEL, BRANCH OFFICES, NEW PRODUCTS, ETC.

## NEW H&H SALES HELP

A booklet entitled "Leaders—How They Lead to Sales" has been published by the Hart & Hegeman Division of the Arrow-Hart & Hegeman Electric Co., Hartford, Conn.

The booklet contains information on how electrical contractors and jobbers' salesmen can work together to obtain bigger profits for the contractor and more sales for the jobber's salesman.

Sales helps are outlined as follows: Adding "Leaders" to specification bids; suggesting additional leaders; store sales, and outside sales.

## TO CAMPAIGN IDENTIFIED CORD IN KEY CITIES

The electrical cord manufacturers' group of N. E. M. A. has developed a promotional campaign for furthering the identified cord movement in the 106 key cities in the country. The campaign is directed to the inspection authorities and the several branches of the electrical industry. Already the movement has received the endorsement of a large number of chief inspectors.

Steel and Tubes, Inc., Cleveland, Ohio, has issued a pamphlet describing Steeltubes, giving the story of the development of the product, and contains illustrations of how Steeltubes can be used. Diagrams are contained showing how to make accurate bends with Steeltubes, and listing Steeltube fittings and bending tools.

The Chicago district sales office of Century Electric Co., St. Louis, Mo., has been changed to 519 Roosevelt Road, Chicago, Ill.

Effective April 1, the Detroit office of the Trumbull Electric Mfg. Co., Plainville, Conn., will be located at 5431 Wabash Avenue. The office was formerly located at 415 Brainard Street.

## BENJAMIN COOPERATIVE SALES PLAN

A cooperative sales plan to build service station and outdoor floodlighting sales through a group of selected contractors has just been announced by the Benjamin Electric Manufacturing Co.

Salesmen for electrical wholesalers are to select the contractors who can best tie in with this kind of a sales program. These contractors are to be asked to furnish the manufacturers with the names of prospects. The manufacturer, in addition to his consumer magazine advertising to this field, will send out at 10-day intervals letters and mailing pieces to the prospects furnished by the contractors, without charge to the contractors. With this publicity approach, it is expected that the contractor by personal calls will be able to close many orders.

Catalog GEA-1520A superseding GEA-1520 has just been published by General Electric Co., Schenectady, N. Y., covering electric heating units and devices. Included in this catalog are descriptions of immersion heaters, cartridge units, strip heaters, miscellaneous helicoil sheath-wire heating units, cast-in hotplates, metal-melting pots, cast-in immersion units, glue-pots, soldering irons, industrial air heaters and control equipment. In

stallation diagrams are shown, together with photographs of the different units, price-lists and data on specific heats, etc.

The Paine Company, Chicago, announces the appointment of Frank H. Kaiser, 510 Prudential Bldg., Buffalo, N. Y., sales representative for western New York state.

#### MACY ENGINEERING UNDER NEW OWNERSHIP

Carl R. Blumenthal and John M. Heddaeus, officers of the Ditmas Electric Co., Brooklyn, N. Y., have assumed ownership of Macy Engineering Co., 1451 39th St., Brooklyn, N. Y., manufacturers of public address equipment. A catalog describing the most modern sound equipment is in the process of preparation.

Carl R. Blumenthal is president of the company; John M. Heddaeus, sales manager, and Robert C. Reinhardt is in charge of the engineering department.

Automatic Switch Co., New York City, has published a bulletin entitled "Magnetic Switches and Relays," describing magnetic switching devices, automatic transfer switches, remote-control switches, magnetic contactors and multiple-circuit contactors. The different units are illustrated, together with dimensions, weights and price-lists.

Announcement is made by Curtis Lighting, Inc., Chicago, that Walter W. Kantack, in association with W. Archibald Weldon, will assume direction and supervision of Curtis design activities.

Under the name of Kantack, Inc., the activities of Kantack & Company, Inc., will be carried on as in the past and expanded with the added strength of the availability of Curtis illuminating engineering experience.

A leaflet describing the application and distinctive features of the Westinghouse Linestart type CS squirrel cage induction motors has been announced by Westinghouse Electric & Manufacturing Co., East Pittsburgh,

## "VALUE PLUS—

### Because It Paid For Itself On The First Job"

Mr. Alfred J. Bambula, whose photograph is shown here, has good reason for liking the Greenlee Conduit Bender. Read his letter.



HERE is little to add to what Mr. Bambula has said in his letter concerning the Greenlee Hydraulic Conduit Bender. This experience, however, is typical of that had by the many other users of these tools, and it suggests the desirability of using one on your next job.

In practically every case, letters on this subject state that Greenlee Benders pay for themselves on the

#### KNOCKOUT TOOLS

Used for enlarging holes in cabinets, panel boards, etc. Leave clean, round holes. No filing or reaming. Punches make enlargements for  $\frac{3}{4}$  to 2-inch conduit. Cutter makes enlargements for  $1\frac{1}{2}$  to 3-inch conduit. Simple and easy to operate.



**GREENLEE TOOL CO.  
ROCKFORD ILLINOIS**

first job. This is a splendid recommendation for them. However, of even greater importance is the fact that, day in and day out, they bend conduit quicker and easier than by any other method; that they make smooth, even bends without crushing; and that these bends make it easier to pull in wire and cable.

It will pay you to know what can be accomplished with these benders, which are made for rigid conduit and thin-wall steel tubing. Just use the coupon for complete information.

**GREENLEE TOOL CO.  
Rockford, Ill.**

Please send complete information on Greenlee Hydraulic Conduit Benders and Knockout Tools.

Name.....

Address.....

City.....

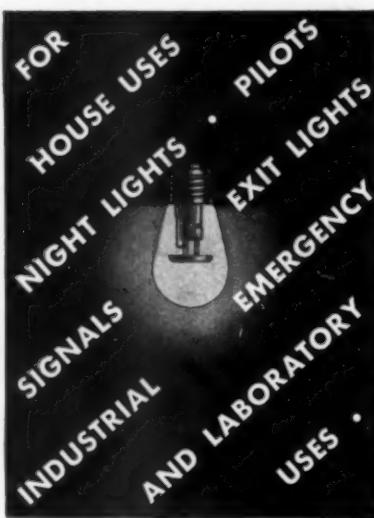
State.....

My Jobber is.....

\$33.

**At the new  
popular prices...  
NEON GLOW  
LAMPS find wider  
uses and daily  
increasing sales**

Count the many uses—and you see at once the possibilities for sales and profits in the NEON GLOW LAMP. At new, drastically reduced prices, too, new uses are being found—raising the demand steadily! The sturdy Neon Glow Lamps give over 3,000 hours continuous service. Available in  $\frac{1}{4}$  to 3 watt sizes. Consume only a few cents worth of current per month. Sell by the hundreds—for exit



**GENERAL  ELECTRIC  
VAPOR LAMP COMPANY**

557 Copyr. 1933, General Electric Vapor Lamp Co.

***Beating Competition  
with Brains***

Competition is tough in the electrical contracting business these days; and every day it gets worse. Successful contractors have found they can beat fly-by-night competition best by using their brains, and by educating their responsible employees. You can help your head men to keep abreast of the times and save you money by sending each his own copy of ELECTRICAL CONTRACTING.

Pa. These motors are equipped with sealed sleeve bearings, and are available for all commercial frequencies and voltages. They are built in sizes from 3 to 200 horsepower.

The Diamond Chain & Mfg. Co., Indianapolis, Ind., has published Motor Drive Data Book No. 78, which is a 64-page booklet containing motor drive tables for selecting the proper roller chain for motor drives from stock, available for  $\frac{1}{4}$  to 75 h.p., ratios up to 8.4 to 1 and speeds up to 1800 R.P.M. Diamond drives are also made in capacities up to 672 h.p. and for speeds up to 3600 R.P.M.

Bulletin No. 105 entitled "Kliegl Spotlights and Accessories" has just been published by Kliegl Bros., New York City. Each unit is fully described and illustrated in this booklet. Price-lists and dimensions are also given, together with a list of miscellaneous accessories and supplies.

J. D. Childers, representative for Clayton Mark & Co., Chicago, has recently located at 6138 McGee St., Kansas City, Mo., from where he will handle the sale of Clayton-Mark steel pipe, conduit, electric metallic tubing and water well supplies. He will cover the southwest and Rocky Mountain territories.

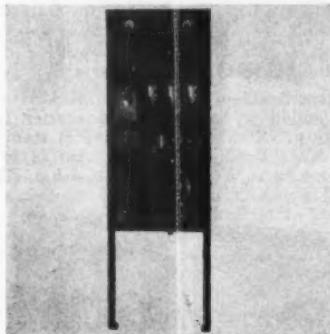
Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has published Catalog No. 219-E illustrating and describing Westinghouse ultra-violet luminaires, showing the varied applications of ultra-violet radiation in combination with lighting units and as separate fixtures. Catalog lists each unit giving specifications and applications, together with price-lists.

The Helwig Co., 3466 So. 13th St., Milwaukee, Wis., has published Catalog No. 3211, covering various types of repulsion induction motors, a.c. and d.c. motors, single phase motors and farm light plants and appliances. The catalog is illustrated and contains carbon brush specifications for the motors.

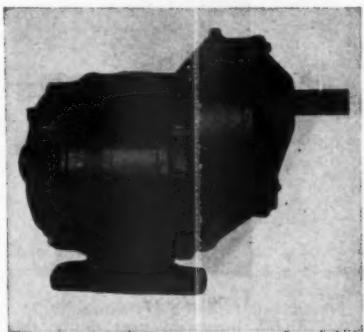
# May New Products

## Controllers

General Electric Co., Schenectady, N.Y., announces a line of controllers for synchronous motors superseding previous standard lines. Control equipment contains relays for automatically applying and removing field excitation and for protecting stator and amortisseur windings.



ings. For automatically applying field excitation when motor reaches a predetermined speed near synchronism, a relay known as slip-frequency field-application relay is provided. Coil of relay is connected across a section of field discharge resistor with a half-wave copper oxide rectifier in series with it. Relay also has a short time delay drop-out which holds contacts open during period of acceleration. Units are also provided with a power-factor field-removal relay which automatically removes field excitation when motor drops out of synchronism. A two-element temperature relay for protecting stator windings and a temperature squirrel-cage protective relay are also included.



## Gearmotors

Type S Westinghouse gearmotors for reducing normally high motor speed to satisfactory operating speeds, providing a simple and compact unit for low operating speeds is announced by Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. Unit is designed for drives from  $\frac{1}{2}$  to 75 h.p. and for 1,550 to 232 r.p.m., and drive may be connected direct to driven equipment or by cog-belts, chains or flat belts. Fourteen reductions of ratios of 1.12: 1 to 5.1 are available for each motor speed and horsepower. Unit uses helical gears fully enclosed and running in a continuous oil bath.



## Enclosed Switches

A line of enclosed switches has been placed on the market by Arrow Electric Division of Arrow-Hart & Hegeman Electric Co., Hartford, Conn., designed for plug fuses, cartridge fuses and no fuses. Among the features of this new line are full-floating, self-adjusting, double-breaks contacts with positive switch action; spring throw-off and -on, and plenty of wiring room at top, bottom and sides. Arc is smothered in porcelain well with fibre carrier-plates between stationary contacts. Units have boxes of aluminum satin finish.

## Plugs and Receptacles

The Pyle-National Co., Chicago, Ill., has developed a line of heavy-duty, fully enclosed type of plugs and receptacles for use with portable tools, ap-



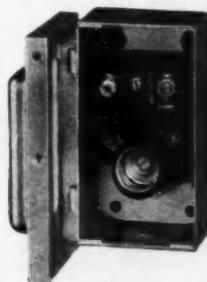
pliances and heating units to withstand the most severe service. They are approved for 20 amp. 250 volt, d.c., 460 volts, a. c. service. Units have cadmium plated, heavy-gauge drawn steel housings with conducting and insulating parts fully enclosed. Live parts cannot be touched when in use. Each style is made in two forms, either with male or female contacts. Receptacles are available for flush mounting, with heavy polished brass plates, or in conduit bodies or surface mounting.

## Photoelectric Cell

G. M. Laboratories, Inc., Chicago, Ill., announces Visirtron type F-2 photoelectric cell, suitable for use with current indicating meters, light intensity measurements, or with sensitive electromagnetic relays without vacuum tube amplification. Sensitive disc in cell is mounted in a polished durable metal case



$2\frac{1}{4}$  in. in diameter and  $\frac{7}{16}$  in. thick, which is hermetically sealed. Terminal studs for electrical connections and mechanical mounting project from rear of cell.



## Disc Switch

The Switch & Panel Division, Square D Co., Detroit, Mich., announces a front-operated 30 amp. or 1 h.p. disc switch known as Catalog No. 90211. Dimensions of this switch are  $5\frac{1}{8}$  in. high by  $3\frac{1}{8}$  in. wide and  $2\frac{3}{4}$  in. deep, having a capacity of 30 amp. at 125 volts, and is a 2-pole switch with one fuse, one blade and solid neutral. Front operation is obtained by a small disc, rotating between two spring copper blades. Terminals are conveniently located. It is held in place by two screws which may be easily removed. Switch is furnished in standard finish of bronze or black, but other colors may be obtained.

## Floodlight Projectors

Electric Service Supplies Co., Philadelphia, Pa., announces type B Golden Glow floodlighting projectors with "deep-bowl" type glass mirror reflectors in 10 to 24 in. diameter, and for use with 200 to 1500 watts. Unit has alumi-

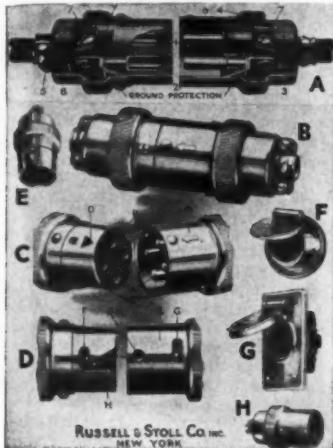


num body with hot galvanized sheet steel base. Door including lens assembly is held rigidly to body of projector by three eccentric type rings and has an aluminum ring gasket. Lens is mounted and sealed with plastic cement within aluminum ring. Reflectors are held in position by spring clamps. An external thumb screw is provided for operating focusing device. A lead of rubber covered weather-proof twin conductor cable is provided at rear of unit for making electrical connections.

# May New Products

## Receptacles, Plugs and Cord Connectors

Russell & Stoll Co., New York City, announces Ever-Lok receptacles, plugs and cord connectors with the following features: Automatic locking; positive



grounding by double phosphor bronze springs; a sponge rubber washer which serves as a bushing and shield to exclude metal particles and dust, and moulded bakelite interiors. Receptacles are sealed to conduit boxes by gaskets and have hinged flap doors gasket lined. All fittings have cadmium-galvanized steel housings. Plugs and connectors have adjustable cord grips, self-wiping and self-aligning contacts and fibre-lined shell caps.

## Meter Range Switches

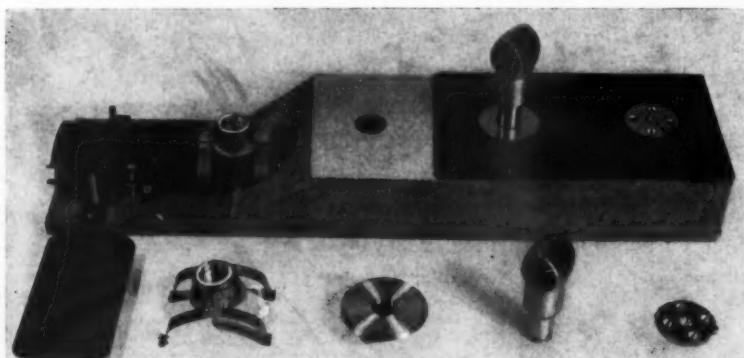
A line of meter range switches has been placed on the market by Cutler-Hammer, Inc., Milwaukee, Wis. Unit herein shown, known as Bulletin 4334 H1, 2, 3, has ample space for excess

lengths of meter leads and when used with 6 terminal meters, prevents non-recording. Cartridge fuse pull-out has knife blade contacts independent of fuse clips. Switch comes with 2, 4 and 6 branch circuit cutouts. Sequence is line—switch—fuse—test link—meter—test link—load. Other switches in group have a sequence of line—meter—switch—fuse—load, with and without safety type main fuse. All switches are black Japan finish.



## Immersion Unit

An immersion unit for oil heating is being marketed by Harold E. Trent Co., Philadelphia, Pa. Body of unit is made of steel of such areas that the watts per square inch are at liberal value to



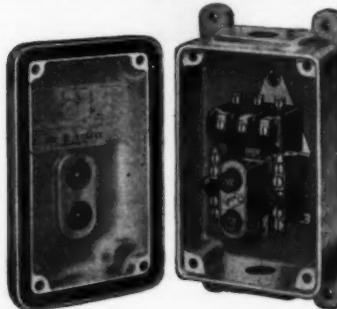
## Outlet Locator

General Electric Co., Bridgeport, Conn., has recently developed "Prelokayet", a device which clamps on fibre under floor duct at the factory or on the job before pouring the concrete. A magnetic finder locates the center pin of the Prelokayet even when concealed by floor covering. This device was designed to permit installation of outlets for telephone or lighting circuits quickly and safely.

minimize carbonizing action. A combined unit can be supplied consisting of pipe assembly, thermostat and electric unit. Method of mounting unit is by means of a flange, whole unit being secured with bolts to purifying equipment. Units can be supplied with 1, 2 or more strips according to wattage required.

## Hand-Operated Starter

Allen-Bradley Co., Milwaukee, Wis., has added a hand-operated starter in splash-proof cabinet to its line of standard Allen-Bradley starters. Unit is for motors up to 3 h.p. 110 volts, 5 h.p. 220



volts and 7½ h.p. 440-550 volts. Start and stop buttons operate mechanism without a magnetic coil. Overload breakers disconnect starter after sustained overload. Cadmium-plated cabinets are provided with rubber covered gaskets and splash-proof push buttons in cabinet cover actuate switch excluding moisture from switch mechanism.



## Time Delay

Type TD-7, hot wire time delay, designed for applications where a short time delay interval with rapid, but not immediate recycling is required, has been placed on the market by Struthers Dunn, Inc., Philadelphia, Pa. Unit consists of a hot wire member, a bow member and two adjustable, fixed contacts, all mounted on a base of insulating materials. Dimensions of base are 7 by 3 in., overall depth 1½ in., including thickness of base. Contacts are rated to carry and break 2 amp. at 110 volts, a.c. or ¼ amp. at 115 volts, d.c., non-inductive load. Actuating member is made of resistance wire or ribbon. It is available either with hinged covers or moulded glass covers.

# May New Products



## Public Address System

RCA Victor Co., New York City, announces a portable public address system which is housed in a single self-contained carrying case. System has a "velocity" ribbon microphone, which is provided with an adjustable desk or table stand. Amplifier is a "high gain" unit utilizing class "B" amplification and providing an output of 20 watts. Two electro-dynamic type loudspeakers are mounted behind grilles in front half of carrying case with a 30-ft. extension cable, together with a 30-ft. cable connected to microphone. System also has volume and tone color controls, a microphone transfer switch, and a voice-music switch for accentuating voice pick-up alone or with a musical background.

## Overload Breaker

Square D Co., Industrial Controller Division, Milwaukee, Wis., announces Class 9020, type W10 "Knockout" overload breaker, designed to mount on and wire into a standard  $\frac{1}{2}$  in. knockout.



Case is made of bakelite and overall dimensions are  $2\frac{1}{8}$  in. high,  $1\frac{3}{8}$  in. wide and  $1\frac{3}{4}$  in. deep. Breaker is of thermal, melting alloy type. After overload trips breaker, it is reset from an indicating button; no replacement parts being required. Contacts are silver to silver, single pole, double break. Maximum rating is  $\frac{3}{4}$  h. p., 110 or 220 volts, a. c.

## Oil-Resisting Cable

General Electric Co., Schenectady, N. Y., has developed an oil-resisting, heat-resisting cable, insulated with Glyptal-treated cloth, which is available in all types. The insulating material known as Glyptal is a synthetic resin, which, the manufacturers claim, is unaffected by mineral oil. Manufacturers also claim that this new cloth maintains its original

properties over long periods of time, even at elevated temperatures. This type cable can be used advantageously for low- and medium-voltage leads, apparatus cable, transformer leads, leads for coils and control devices or wherever an oil-resisting, heat-resisting cable is required.

## Photoelectric Cell

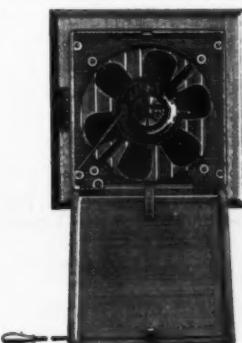
A self-generating type of photoelectric cell for general application and service in laboratory, commercial and industrial fields is being manufactured by J. Thos. Rhamstine, Detroit, Mich., known as the Rhamstine "Electronic"



cell. It is of the dry disc type and transforms light energy directly into electrical energy, without aid of batteries or any other source of emf. Unit is constructed of metal, except for the plain lens over face of cell, and is compact, measuring  $2\frac{3}{8}$  in. diameter and 1 in. thick. It is equipped with two connection prongs which fit the standard UX radio tube socket. In combination with a sensitive relay and an auxiliary relay power circuits can be turned on or off.

## Ventilating Fans

Reversible ventilating fans for home kitchens have been placed on the market by Emerson Electric Mfg. Co., St. Louis, Mo., in three sizes, 9, 12 and 16 in. The 9 and 12 in. fans are dual pur-

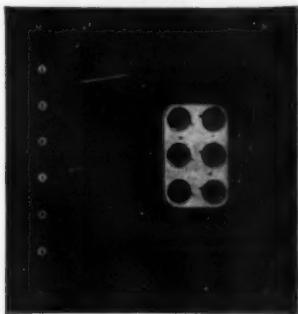


pose, electrically reversible by means of a toggle-switch on the motor, whereby blades can be reversed so that fan draws in outdoor air instead of exhausting indoor air. The 16 in. fan is not reversible and is used for expelling air only. Motors are fully enclosed and dust-proof and designed to operate for at least one year with relubrication. The 9 and 12 in. fans have rubber bushings in four mounting supports for use where neither wall boxes or panel

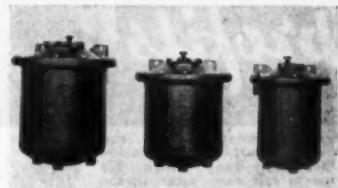
mountings are designed. The 16 in. fan has a mounting ring. Adjustable wall boxes for built-in installations can also be supplied for 9 and 12 in. fans.

## Panellettes

The Switch and Panel Division of Square D Co., Detroit, Mich., announces a line of fuse panellettes providing for switch circuits. Front trim may be removed by taking out four corner screws. Box is conveniently arranged



for mounting toggle switches and wiring from fuses to switches and space is provided for bell ringing transformer. Oblong knockouts are provided in trim for switches, one knockout for each circuit. Any standard square handle toggle switch may be used and switches are mounted independently of door. Cabinets providing for 4, 6, 8, 10 and 12 circuits are available. Flush trim is finished in black Crystallac.



## Magnetic Switches

A new line of full voltage magnetic switches is announced by General Electric Co., Schenectady, N. Y., for industrial control equipment for use in Class 1, Group D hazardous locations. Units are standard General Electric magnetic switches with special operating coils and contact tips for operation under oil, and an oil-immersed temperature overload relay. Cylindrical cast iron oil tank and top cover have wide metal to metal flanges machined at close limits to insure a tight fit. Switch and oil-immersed overload relay are fastened to top cover and extend down into oil. Relay can be reset by means of a button which extends through top cover. Three threaded conduit entrances are provided in top cover for connection to line, motor and remotely mounted push-button station. Switches are weatherproof.

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## Index to Advertisers

### A

Arrow-Hart & Hegeman Electric Co.,  
The ..... 21

### J

Jefferson Electric Company .....  
..... Inside Front Cover

### B

Burndy Engineering Co., Inc. .... 40

### M

McGill Manufacturing Co. .... 38  
Metropolitan Device Corporation .... 30  
Minerallac Electric Co. .... 40

### C

Central Tube Company .....  
..... Inside Back Cover

### P

Pyle-National Company, The ..... 26

### E

Electric Storage Battery Company .. 35

### S

Sangamo Electric Co. .... 22  
Steel and Tubes, Incorporated ..... 2

### F

Fairbanks, Morse & Co. .... 33  
Fretz-Moon Tube Co., Inc. .... 34

### T

Trumbull Electric Manufacturing  
Co., The ..... 29

### G

General Cable Corporation ..... 27  
General Electric Co. ....  
..... 24, 25, 31, Back Cover  
General Electric Vapor Lamp Com-  
pany ..... 42  
Graybar Electric Company ..... 4  
Greenlee Tool Co. .... 41

### W

Westinghouse Electric & Manufactur-  
ing Co. .... 37  
Wiegand Company, E. L. .... 46  
Wiremold Company, The ..... 38

### H

Henderson-Hazel Corporation ..... 39

### Y

Youngstown Sheet and Tube Co.,  
The ..... 23

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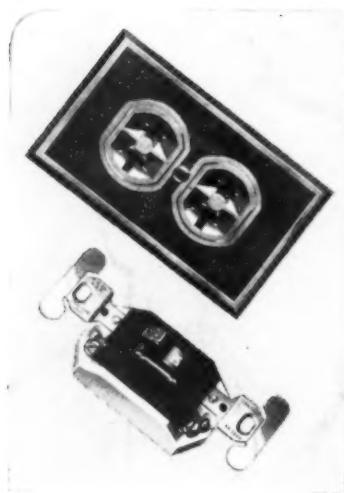


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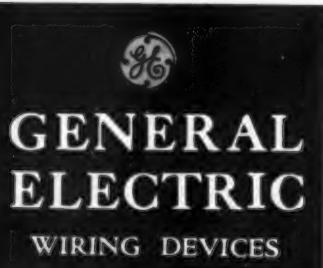
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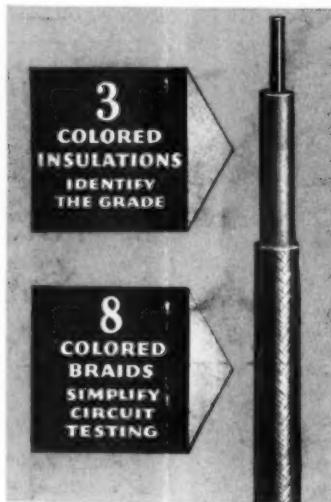
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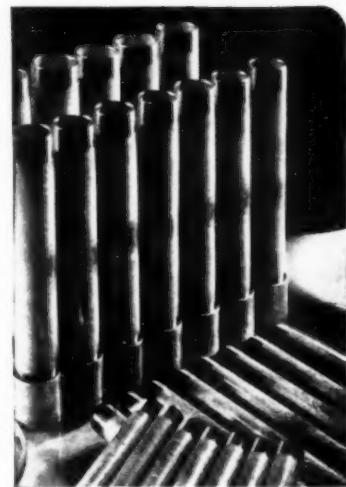
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